Google

Remove items from Search History (Beta) for jronee@yahoo.com

Search History
- Web
- Images
- News
- Froogle

Select all
Pause
Remove items
Trends[New!]

Bookmarks
Add bookmark

Remove | Cancel | Select: All, None | Clear entire Search History »

Feb 1, 2006

- **related:www.rand.org/pubs/monograph_reports/MR1096/MR1096.appb.pdf**
- **risk "stock out"**
  - BASIC INVENTORY THEORY AND TERMINOLOGY
    www.rand.org/pubs/monograph_reports/MR1096/MR1096.appb.pdf
- **DOS methodology average demand inventory**
  - 04 MR1096 Chap3 - 2 visits
    www.rand.org/pubs/monograph_reports/MR1096/MR1096.chap3.pdf
  - Dollar Cost Banding: A New Algorithm for Computing Inventory ...
    www.rand.org/pubs/monographs/2004/RAND_MG128.sum.pdf

Jan 31, 2006

- **"stock out" risk calculation**
  - BOLA - Inventory / Stock Control Systems
    www.bola.biz/operations/stock/systems.html
  - 04 MR1096 Chap3 - 2 visits
    www.rand.org/pubs/monograph_reports/MR1096/MR1096.chap3.pdf
  - http://spm.rwsuk.com/
- **"stock out" risk**
  - Spares Calculator - The powerful spares parts inventory ...
    www.sparescalculator.com/
- **"shortage report" manufacturing**
  - http://www.peeriod.net/manufacturing_order_management.html
- **"shortage report"**
- **"paul dagum" risk**
- **"moishe goldbach" risk**
- **"michael goldbach" risk**
- **"michael goldbach"**
- **"balazs kralik" manufacturing**
- **"balazs kralik" ATO**

☐ "balazs kralik" gating

☐ "balazs kralik" shortage

Remove Cancel Select: All, None | Clear entire Search History »

Sign in

Google Web Images Groups News Froogle Local more »

contingency plan inventory shortage Search Advanced Search Preferences

Web Results **1** - **10** of about **213,000** for **contingency plan inventory shortage**. (**0.42** seconds)

NPR : Kerry Announces **Plan** on Flu Vaccine **Shortage**
Root of the Flu Vaccine **Shortage**. MICHELE NORRIS, host: From NPR News, ...
ROVNER: The Bush administration says it does have a **contingency plan**. ...
www.npr.org/templates/story/story.php?storyId=4115249 - Similar pages

The Manufacturer.com - Predicting the unpredictable
Can pre-event **contingency planning** curtail the impact of a disaster? ...
Common contingencies for a disaster-driven **inventory shortage** may include the ...
www.themanufacturer.com/us/detail.html?contents_id=3219 - 25k - Cached - Similar pages

[PDF] CHAPTER 8 WATER **SHORTAGE CONTINGENCY PLAN**
File Format: PDF/Adobe Acrobat - View as HTML
In 2004, IEUA performed an **inventory** of drought related ordinances that are ...
Water **Shortage Contingency Plan** Check List by Agency. IEUA Member Agency ...
www.ieua.org/docs/Reports/ 2005%20UWMP/chapters/Chapter8.pdf - Similar pages

[PDF] Guidelines on Managing Drug Product **Shortages**
File Format: PDF/Adobe Acrobat
inventory of the **shortage** drug product and possible alter- ... **contingency plan** that encompasses those aspects of prepara- ...
www.ashp.org/bestpractices/ drugdistribution/Procure_Gdl_Shortages.pdf - Similar pages

> [PDF] ASHP Guidelines on Managing Drug Product **Shortages**
> File Format: PDF/Adobe Acrobat - View as HTML
> **shortages** and recommends a general. process for **inventory** management ... develop a **contingency planning**. strategy to prepare for the possibility ...
> www.ashp.org/public/pubs/ ajhpopen/8a-ASHP-R-Guidelines.pdf - Similar pages

The "Oops!" factor
Most companies focus **contingency plans** on what to do after something goes ...
An **inventory shortage** created by a strike calls for a very different set of ...
www.logisticstoday.com/sNO/ 6407/iID/20886/LT/displayStory.asp - 44k - Cached - Similar pages

Legal Aspects of Supply Chain Continuity and **Contingency Planning**
An evaluation of what is likely to occur should therefore guide any decision to build up **inventory**. **Contingency planning** activities should be conducted in ...
www.gahtan.com/alan/articles/supplychain.htm - 10k - Cached - Similar pages

[PDF] sonia's pdf
File Format: PDF/Adobe Acrobat - View as HTML
Inventory Shortages or. Imbalances. Vintage Receivables. Short-term Financing ... No Strategic **Planning**. No **Contingency Planning**. Developing Customised ...
www.pwcglobal.com/nz/eng/ ins-sol/publ/pcs/DiagnosticChart.pdf - Similar pages

Dear Medical Device Firm President/CEO:
... conducting an **inventory** of all systems and components, developing a **plan** for ... Development of **Contingency Plans** - This includes all activities to ...
www.fda.gov/cdrh/yr2000/cdrh/letters/ 990618/htm/y2kreadiness-survey-instructions.htm - 14k -

Cached - Similar pages

[PDF] Just-in-Time **Inventory**: Effects on Earthquake Recovery
File Format: PDF/Adobe Acrobat - View as HTML
damaged production facilities and **inventories** cause. **shortages** of inputs ...
Business continuity **planning**. Business **contingency** planners in the Seale area ...
www.crew.org/papers/JITfinal032405.pdf - Similar pages

Try your search again on Google Book Search

Goooooooooogle ▶
Result Page: 1 2 3 4 5 6 7 8 9 10 **Next**

contingency plan inventory shortage Search

Search within results | Language Tools | Search Tips | Dissatisfied? Help us improve

Google Home - Advertising Programs - Business Solutions - About Google

Sign in

Google Web Images Groups News Froogle Local more »

contingency plan inventory shortage predict ris Search Advanced Search Preferences

Web Results **1** - **10** of about **60,600** for **contingency plan inventory shortage predict risk**. (**0.32** seconds)

Scholarly articles for **contingency plan inventory shortage predict risk**

Prevention Is Better Than Cure - by Kajko-Mattsson - 0 citations
The crisis manager: Facing risk and responsibility - by Lerbinger - 26 citations
Systemic Risk: A Fannie Mae Perspective - by Fahey - 3 citations

Managing Uncertainty in **Planning** and Forecasting

Some **contingency** strategies are specific to **risks** while others are targeted at ... Within a fairly short span of time **inventory shortages** can turn into ...
www.intel.com/technology/itj/2005/ volume09issue03/art01_mnguncertainty/p04_solutions.htm - 50k - Cached - Similar pages

[PDF] Guidelines on Managing Drug Product **Shortages**

File Format: PDF/Adobe Acrobat
predict when **shortages** will occur, the process for dealing ... **contingency plan** that encompasses those aspects of prepara- ...
www.ashp.org/bestpractices/ drugdistribution/Procure_Gdl_Shortages.pdf - Similar pages

[PDF] ASHP Guidelines on Managing Drug Product **Shortages**

File Format: PDF/Adobe Acrobat - View as HTML
product **shortages** are similar to di-. saster **planning** and **risk** manage- ...
develop a **contingency planning**. strategy to prepare for the possibility ...
www.ashp.org/public/pubs/ ajhpopen/8a-ASHP-R-Guidelines.pdf - Similar pages

Just-in-Time to Just-in-Case - Graziadio Business Report

... in the number of disruptions, but little change in **contingency planning**. ...
Each component in the supply chain, from sourcing to **inventory** to ...
gbr.pepperdine.edu/032/supplychain.html - 26k - Cached - Similar pages

Print - Just-in-Time to Just-in-Case - Managing a Supply Chain in ...

However, **shortages** caused by natural, political or technological disruptions ... in the number of disruptions, but little change in **contingency planning**. ...
gbr.pepperdine.edu/032/print_supplychain.html - 20k - Cached - Similar pages

Health Service Y2K **Contingency Planning**

Risk Management and **Contingency Planning** for Health Service Providers ...
The **inventory** of medical systems and their Y2K status prepared by the Y2K Team at ...
www.geocities.com/Vienna/Opera/4877/cont**plan**health.html - 38k - Cached - Similar pages

[PDF] Drought Preparedness **Planning**: Building Institutional Capacity

File Format: PDF/Adobe Acrobat - View as HTML
plans to deal with these extended periods of water **shortage** ... early warning, and **prediction**; (2) **risk** and impact assess- ...
www.drought.unl.edu/**plan**/handbook/10step_rev.pdf - Similar pages

Professor Yossi Sheffi: General Media: A Demand for Steady Supply

But managers can reduce forecasting **risks** by making supply chains more ... and use the estimates to guide supply contracting terms and **contingency plans**. ...
web.mit.edu/sheffi/www/selectedMedia/ genMedia.aDemandForSteadySupply.html - 17k -

Cached - Similar pages

[PDF] TheRegionalEconomicReview
File Format: PDF/Adobe Acrobat - View as HTML
include **inventory shortages** or surpluses and large scale. billing errors. ...
tems and have in place existing crisis **contingency plans**. ...
www.marshall.edu/cber/research/ RER/RER%20Summer%201999.pdf - Similar pages

[PDF] Optimizing the Supply Chain Through Trial Simulation
File Format: PDF/Adobe Acrobat - View as HTML
outcome's likeliness, appropriate **contingency plans** can be. devised or the supply
strategy adjusted to ... small possibility of a site **inventory shortage**. ...
www.clinphone.com/files/ Optimizing%20Supply%20Chain_July04_ACT_ND.pdf - Similar pages

Try your search again on Google Book Search

Gooooooooogle ▶
Result Page: 1 2 3 4 5 6 7 8 9 10 **Next**

contingency plan inventory shortage Search

Search within results | Language Tools | Search Tips | Dissatisfied? Help us improve

Google Home - Advertising Programs - Business Solutions - About Google

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	330	705/28 and (risk or probability or likelihood)	USPAT	OR	OFF	2006/02/01 11:52
L2	42	705/28 and (risk or probability or likelihood) and (gating or gate or stockout or shortage or (stock adj out))	USPAT	OR	OFF	2006/02/01 12:41
L3	208	705/10.cor.	USPAT	OR	OFF	2006/02/01 12:41
S1	41788	gating	USPAT	OR	OFF	2006/01/27 09:04
S2	1	gating near risk	USPAT	OR	OFF	2005/08/25 13:41
S3	53	component near gating	USPAT	OR	OFF	2005/08/25 13:42
S4	10	("4744026" | "4744027" | "4744028" | "4894773" | "4914563" | "4924386" | "5185715" | "5630070" | "5970465" | "6138103").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/08/25 14:50
S5	5	fulfillment near failure	USPAT	OR	OFF	2005/09/12 13:41
S6	5776	(component or resource) near (short or limit$)	USPAT	OR	OFF	2005/09/12 13:42
S7	560	S6 and risk	USPAT	OR	OFF	2005/09/12 13:41
S8	303	S7 and (production or manufacturing)	USPAT	OR	OFF	2005/09/12 13:41
S9	6	((component or resource) near (short or limit$)) with risk	USPAT	OR	OFF	2005/09/12 14:44
S10	6332	failure with risk	USPAT	OR	OFF	2005/09/12 13:44
S11	198	(component or resource) with failure with risk	USPAT	OR	OFF	2005/09/12 13:44
S12	85	S11 and (production or manufacturing)	USPAT	OR	OFF	2005/09/12 13:44
S13	5776	((component or resource) near (short or limit$))	USPAT	OR	OFF	2005/09/12 14:44
S14	85	(component or resource) near (shortage)	USPAT	OR	OFF	2005/09/12 15:51
S15	33	gate near mapping	USPAT	OR	OFF	2005/09/12 15:47
S16	9549	bottleneck	USPAT	OR	OFF	2005/09/12 15:47
S17	33	bottleneck with risk	USPAT	OR	OFF	2005/09/13 11:15
S18	0	(procurement near planning) with (shortage)	USPAT	OR	OFF	2005/09/12 15:54
S19	1	(procurement near planning) and(shortage)	USPAT	OR	OFF	2005/09/12 15:52
S20	4	(procurement near planning) and risk	USPAT	OR	OFF	2005/09/12 15:52
S21	37	(procurement near planning)	USPAT	OR	OFF	2005/09/12 15:54
S22	39	bottleneck with (chance or risk)	USPAT	OR	OFF	2005/09/13 11:16
S23	1	"6868298".pn.	USPAT	OR	OFF	2005/09/22 15:52

S24	1	"5615109".pn.	USPAT	OR	OFF	2005/09/22 15:52
S25	50	(obsolescence or gating or shortage or bottleneck) near (risk or probability)	USPAT	OR	OFF	2005/09/22 16:54
S26	24	S25 and (manufactur$ or production)	USPAT	OR	OFF	2005/09/22 15:59
S27	2	stock-out near (risk or probability)	USPAT	OR	OFF	2005/09/22 16:56
S28	2	compar$ with production with (quantity or amount) with risk	USPAT	OR	OFF	2005/09/22 16:57
S29	494	compar$ with (average or mean) with production	USPAT	OR	OFF	2005/09/22 16:57
S30	7	S29 and allocat$	USPAT	OR	OFF	2005/09/22 16:57
S31	137	(ATO or (assemble adj to adj order)) and risk	USPAT	OR	OFF	2006/01/27 09:08
S32	1	(ATO or (assemble adj to adj order)) and risk and fulfillment	USPAT	OR	OFF	2006/01/27 09:05
S33	57	(ATO or (assemble adj to adj order)) and risk and short	USPAT	OR	OFF	2006/01/27 09:06
S34	80	(ATO or (assemble adj to adj order)) and risk not short	USPAT	OR	OFF	2006/01/27 09:09
S35	11	("5237495" | "5287267" | "5515269" | "5963919" | "6078850" | "6151582" | "6321132" | "6377953" | "6516301" | "6611726" | "6816839").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2006/01/27 09:39
S36	1010	(shortage or short) near risk	USPAT	OR	OFF	2006/01/27 09:43
S37	727	S36 and (production or manufacturing or assembly or inventory)	USPAT	OR	OFF	2006/01/27 09:39
S38	30	((shortage or short) near risk) with (production or manufacturing or assembly or inventory)	USPAT	OR	OFF	2006/01/27 10:59
S39	0	(bottleneck near risk) with (production or manufacturing or assembly or inventory)	USPAT	OR	OFF	2006/01/27 09:45
S40	0	(bottleneck near (probability or risk)) with (production or manufacturing or assembly or inventory)	USPAT	OR	OFF	2006/01/27 09:45
S41	831	bottleneck with (production or manufacturing or assembly or inventory)	USPAT	OR	OFF	2006/01/27 09:45
S42	115	(bottleneck with (production or manufacturing or assembly or inventory)) and (forecast$ or risk or probability)	USPAT	OR	OFF	2006/01/27 10:42
S44	3652	component near plan$	USPAT	OR	OFF	2006/01/27 10:43
S45	3	(component near plan$) with risk	USPAT	OR	OFF	2006/01/27 10:43
S46	3712	component near limit$	USPAT	OR	OFF	2006/01/27 10:44
S47	352	(component near limit$) and risk	USPAT	OR	OFF	2006/01/27 10:44

S48	261	(component near limit$) and risk and (manufacturing or production or assembly)	USPAT	OR	OFF	2006/01/27 10:44
S49	760	(component near limit$) and risk and (manufacturing or production or assembly)	USPAT	OR	ON	2006/01/27 10:44
S50	29	((component near limit$) with (manufacturing or production or assembly)) and risk	USPAT	OR	ON	2006/01/27 10:44
S51	0	((shortage or short) near risk) with (stock or inventory)	USPAT	OR	OFF	2006/01/27 10:59
S52	2756	(shortage or short) with (stock or inventory)	USPAT	OR	OFF	2006/01/27 10:59
S53	271	((shortage or short) with (stock or inventory)) and risk	USPAT	OR	OFF	2006/01/27 10:59
S54	115	((shortage or short) with (stock or inventory)) and risk and component	USPAT	OR	OFF	2006/01/27 11:06
S55	1010	(shortage or short) near risk	USPAT	OR	OFF	2006/01/27 11:00
S56	11	((shortage or short) near (stock or inventory)) and risk and component	USPAT	OR	OFF	2006/01/27 11:00
S57	4485	((shortage or short or constrain$) with (resource or component or stock or inventory)) and risk	USPAT	OR	ON	2006/01/27 11:06
S58	256	((shortage or short or constrain$) with (resource or component or stock or inventory)) with risk	USPAT	OR	ON	2006/01/27 11:06
S59	189	(((shortage or short or constrain$) with (resource or component or stock or inventory)) with risk) and (manufacturing or assembly or production)	USPAT	OR	ON	2006/01/27 11:14
S60	1	"20020138316".pn.	US-PGPUB	OR	ON	2006/01/30 13:30
S61	1	"6941305".pn.	USPAT	OR	ON	2006/01/27 13:50
S62	31	shortage near risk	US-PGPUB; USPAT	OR	ON	2006/01/30 13:32
S63	43	obsolesc$ near risk	US-PGPUB; USPAT	OR	ON	2006/01/30 13:33
S64	17	(obsolesc$ near risk) and (manufacturing or production)	US-PGPUB; USPAT	OR	ON	2006/01/30 14:33
S65	9	risk near (stock adj out)	US-PGPUB; USPAT	OR	ON	2006/01/31 09:24
S66	1	"6895384".pn.	US-PGPUB; USPAT	OR	ON	2006/01/31 09:34
S67	1	"5446671".pn.	US-PGPUB; USPAT	OR	ON	2006/01/31 12:30
S68	10	procurement near risk	US-PGPUB; USPAT	OR	ON	2006/01/31 14:11

S69	158	$diaz$-susanna$.xa,xp.	USPAT	OR	ON	2006/01/31 14:12
S70	26	S69 and constraint$1	USPAT	OR	ON	2006/01/31 14:12
S71	0	S70 and culprit?1	USPAT	OR	ON	2006/01/31 14:12
S72	1	S70 and culprit$1	USPAT	OR	ON	2006/01/31 14:12
S73	299	(risk$ or likely or likelihood or percentage or chance or probabilit$) near5 (shortage or inavailabl$ or unavailabl$ or (run adj out) or (stock adj out) or short) near5 (component or part)	USPAT	OR	ON	2006/01/31 14:19
S74	202	S73 and (manufactur$ or production)	USPAT	OR	ON	2006/01/31 14:14
S75	297	(risk or likely or likelihood or percentage or chance or probabilit$) near5 (shortage or inavailabl$ or unavailabl$ or (run adj out) or (stock adj out) or short) near5 (component or part)	USPAT	OR	ON	2006/01/31 14:20
S76	133	(risk or likely or likelihood or percentage or chance or probabilit$) near5 (shortage or inavailabl$ or unavailabl$ or (run adj out) or (stock adj out) or short) near5 (component or part)	USPAT	OR	OFF	2006/01/31 14:20

2-1-06
ABC KWIC TI

```
 b fulltext1, fulltext2

      12sep05 12:22:36 User268077 Session D264.1
           $0.00    0.214 DialUnits FileHomeBase
     $0.00  Estimated cost FileHomeBase
     $0.24  TELNET
     $0.24  Estimated cost this search
     $0.24  Estimated total session cost   0.214 DialUnits


SYSTEM:OS  - DIALOG OneSearch
  File  15:ABI/Inform(R) 1971-2005/Sep 10
         (c) 2005 ProQuest Info&Learning
  File  16:Gale Group PROMT(R) 1990-2005/Sep 09
         (c) 2005 The Gale Group
  File 148:Gale Group Trade & Industry DB 1976-2005/Sep 12
         (c)2005 The Gale Group
  File 160:Gale Group PROMT(R) 1972-1989
         (c) 1999 The Gale Group
  File 275:Gale Group Computer DB(TM) 1983-2005/Sep 09
         (c) 2005 The Gale Group
  File 621:Gale Group New Prod.Annou.(R) 1985-2005/Sep 12
         (c) 2005 The Gale Group
  File   9:Business & Industry(R) Jul/1994-2005/Sep 08
         (c) 2005  The Gale Group
  File  20:Dialog Global Reporter 1997-2005/Sep 12
         (c) 2005 Dialog
  File 476:Financial Times Fulltext 1982-2005/Sep 12
         (c) 2005 Financial Times Ltd
  File 610:Business Wire 1999-2005/Sep 12
         (c) 2005 Business Wire.
*File 610: File 610 now contains data from 3/99 forward.
Archive data (1986-2/99) is available in File 810.
  File 613:PR Newswire 1999-2005/Sep 12
         (c) 2005 PR Newswire Association Inc
*File 613: File 613 now contains data from 5/99 forward.
Archive data (1987-4/99) is available in File 813.
  File 624:McGraw-Hill Publications 1985-2005/Sep 12
         (c) 2005 McGraw-Hill Co. Inc
*File 624: Homeland Security & Defense and 9 Platt energy journals added
Please see HELP NEWS624 for more
  File 634:San Jose Mercury  Jun 1985-2005/Sep 10
         (c) 2005 San Jose Mercury News
  File 636:Gale Group Newsletter DB(TM) 1987-2005/Sep 09
         (c) 2005 The Gale Group
  File 810:Business Wire 1986-1999/Feb 28
         (c) 1999 Business Wire
  File 813:PR Newswire 1987-1999/Apr 30
         (c) 1999 PR Newswire Association Inc

Set     Items   Description
S1          0   GATING (N) RISK
S2        245   MANUFACTURING (S) GATING
S3         65   S2 AND RISK
S4         65   Sort S3/ALL/PY
S5         13   MANUFACTURING (S) GATING (S) RISK
S6         13   Sort S5/ALL/PY
```

?
t s6/3,k/all

6/3,K/1 (Item 1 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

02542435 288465491
A new game plan for pharma HR
Gabruk, Bob
Pharmaceutical Executive v23n1 PP: 52-58 Jan 2003
ISSN: 0279-6570 JRNL CODE: PHX
WORD COUNT: 2081

...ABSTRACT: new operational paradigm for HR in a somewhat unlikely place: research and development. To minimize **risk** and maximize opportunity, many pharma R&D departments have partnered with marketing and **manufacturing** to create collaborative approaches that include techniques such as cross-functional reviews, portfolio management, and **gating** -decision points for moving a project forward. This article shows pharma companies how they can...
...TEXT: that companies properly allocate people, time, and capital to the highest priority initiatives. To minimize **risk** and maximize opportunity, many pharma R&D departments have partnered with marketing and **manufacturing** to create collaborative approaches that include techniques such as cross-- functional reviews, portfolio management, and **gating** -decision points for moving a project forward.

This article shows pharma companies how they can...

6/3,K/2 (Item 2 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

31684608
Braintech 3D-Vision Guided Robotic Solution Installed at General Motors Massena Plant
CANADA NEWSWIRE
October 13, 2003
JOURNAL CODE: WCNW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 802

... newly cast paired engine heads prior to robotic grasping and subsequent feeding into a de- **gating** machine that removes excess metal and separates the pair of heads. An ABB IRB 6400...

...platform, is proving its value by being able to handle a wide variety of different **manufacturing** operations. The advantage for an enterprise such as GM is that their investment is not...

... in 1908, GM has been the global automotive sales leader since 1931. GM today has **manufacturing** operations in 32 countries and its vehicles are sold in more than 190 countries. In...

... in approximately 100 countries. About Braintech www.braintech.com Braintech's VGR technologies are revolutionizing **manufacturing** by giving

industrial robots the "eyes" to handle and assemble parts with a high degree...

... new release include statements regarding the great potential for vision guided robotics and Braintech revolutionizing **manufacturing** . It is important to note that actual outcomes and the Company's actual results could...

... that affect the technology and automotive industry in general. Readers should also refer to the **risk** disclosures outlined in the Company's annual report of Form 10-KSB for the 2002...

6/3,K/3 (Item 3 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

31380263 (USE FORMAT 7 OR 9 FOR FULLTEXT)
BHP Billiton Ltd Stainless Steel Materials CSG Briefing Conference Call - Part 2
FAIR DISCLOSURE WIRE
September 25, 2003
JOURNAL CODE: WFDW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 4613

... would be the key to survival. In other words where we had to adopt a **manufacturing** mindset, not so much a value of the resource on the ground mindset. We set... together with complete infrastructure and a support industry network in an area of low sovereign **risk** . These factors take years to establish and are often overlooked in new projects at their ... is able to be operated independently of the pressure-leaching step, it significantly reduces processed **risk** . The next major process step is the CCB Circuit to separate tailing solids from the...

... controls, every process step is the same as is currently employed at Yabulu. The technical **risk** in the complex refining part of the circuit is minimized. Products will be the same as currently produced and shipped to world markets, so marketing **risk** is also minimized as we will not need to compromise on our product premiums just...

... selection. It is of course subject to the rigors of the BHP Billiton's toll **gating** process. I will now hand over to Steve Roberts, who will elaborate on Phase II...

...for organic growth within the nickel industry for good projects with the right economic and **risk** profiles based on our projections of supply and demand. I guess you will now realize...next few years, but as you all realize like all grass roots exploration is high **risk** . We are currently spending in the order of $7.5m a year on exploration and...

... second front-end investment from our project pipeline. Now preferred approach to manage funding and **risk** , it is likely that future projects will be offshore. (indecipherable) large projects which will probably...

6/3,K/4 (Item 4 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

29672617
Braintech to install first 3D-VGR system into General Motors plant
CANADA NEWSWIRE
June 16, 2003
JOURNAL CODE: WCNW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 817

... BRHI), a company that has pioneered 3-D Vision Guided Robotics (3D-VGR) for industrial **manufacturing** , announced today that General Motors Corp. has ordered a 3D VGR system from ABB USA...

...pair has been calculated, the robot picks it up and places it into a de- **gating** machine, which saws off the metal connecting the two heads, thus separating them for assembly...

... in 1908, GM has been the global automotive sales leader since 1931, and today has **manufacturing** operations in 32 countries and sells its vehicle in more than 190 countries. In 2002...

... in approximately 100 countries. About Braintech www.braintech.com Braintech's VGR technologies are revolutionizing **manufacturing** by giving industrial robots the "eyes" to handle and assemble parts with a high degree...

... that affect the technology and automotive industry in general. Readers should also refer to the **risk** disclosures outlined in the Company's annual report of Form 10-KSB for the 2002...

6/3,K/5 (Item 5 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

27661214
Q4 2002 Cerus Earnings Conference Call - Final - Part 1
FAIR DISCLOSURE WIRE
January 30, 2003
JOURNAL CODE: WFDW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 4402

... the commercial arena, including challenges in the areas of new product rollout, commercial scale of **manufacturing** and extended regulatory reviews. As we tackled many issues in close collaboration with our partner...

... to Intercept platelets. The blood banking market is careful in implementing any changes to their **manufacturing** of blood components. Strict government oversight coupled with the various requirements in place to ensure safety will continue to be **gating** issues to the speed of adoption. Unlike a pharmaceutical launch, where early adopters prescribe a ...

... donors validations with great results. Within the U.S., there is heightened awareness of the **risk** of transfusions with an infection. Due to the latest emerging virus West Nile. Large-scale...

... heels of restrictions for donors who have lived in Europe or traveled abroad to certain **risk** areas. The current system which is stressed by a limited supply of qualified donors would...a report on efficacy and safety. We will do this in coordination with the final **manufacturing** module so for the moment we're continuing to enroll patients in the phase 3C... taking longer than we expected. Once we pinpoint an optimal design, we can begin our **manufacturing** runs and stability studies which can ultimately be used in the **manufacturing** section for the regulatory submission. At this time, it is difficult to predict how long...

6/3,K/6 (Item 6 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

39588107 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Pfizer Analyst Meeting - Part 7
FAIR DISCLOSURE WIRE
November 30, 2004
JOURNAL CODE: WFDW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 3878

... cut because you're splicing in a new vessel. So this is a (indiscernible) high- **risk** population, sort of a unique population. At the same time, with Parecoxib arm you are...

... opportunities to accelerate the development and filing of those programs? And secondly, on Macugen, is **manufacturing** a **gating** item in terms of final approval or a launch of that product?
HANK MCKINNELL: Your...

6/3,K/7 (Item 7 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

33795410 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Event Brief of Q4 2003 Allergan Earnings Conference Call - Part 1
FAIR DISCLOSURE WIRE
January 28, 2004
JOURNAL CODE: WFDW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 4668

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... to be engaged in. So that is the thinking. It is all about parsing through **risk** and **gating** the attractiveness of various programs. Interestingly, Lumigan in Japan is similar. Obviously on the front...

... fund the next program or the top of the unfunded list. Q9. On the contract **manufacturing** with AMO, it looks like that is anticipated to run at the same level as...

6/3,K/8 (Item 8 from file: 613)
DIALOG(R)File 613:PR Newswire

0001704688 IB7608B40DD9A11D985CCC9EBE378C62B (USE FORMAT 7 FOR FULLTEXT)
Nanotechnology's Environmental, Health, and Safety Risks Can Be Addressed Responsibly Today Lux Research report finds that more nano-enabled products are exposed to perceived risks than real ones
PR Newswire
Wednesday, June 15, 2005 T12:27:00Z
JOURNAL CODE: PR LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 833

...a threat regardless of whether or not it is real. Both are equally important in **gating** the progress of nanotechnology commercialization. * Many nanotechnology applications, such as nanoimprint lithography and insulation made...

...life cycle. Workers have the potential to be exposed to large quantities of nanoparticles at **manufacturing** , but in factory environments that can be tightly controlled; consumers are unlikely ever to be...

...stage with the greatest uncertainty and need for more research. * Of $8 trillion in projected **manufacturing** output incorporating nanotechnology through 2014, Lux Research calculates that 25% is exposed to real **risk** at **manufacturing** , which should be easiest to mitigate. 7% is exposed to real **risk** at use, and 14% is exposed to **risk** at end-of-life. However, 40% is exposed to perceptual **risk** .

The report finds that nanotech EHS risks require specific actions from corporations, start-ups, investors...

6/3,K/9 (Item 9 from file: 613)
DIALOG(R)File 613:PR Newswire

0001704686 IB512A3A0DD9A11D985CCC9EBE378C62B (USE FORMAT 7 FOR FULLTEXT)
Nanotechnology's Environmental, Health, and Safety Risks Can Be Addressed Responsibly Today Lux Research report finds that more nano-enabled products are exposed to perceived risks than real ones
PR Newswire
Wednesday, June 15, 2005 T12:27:00Z
JOURNAL CODE: PR LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 833

...a threat regardless of whether or not it is real.
Both are equally important in **gating** the progress of nanotechnology
commercialization.
* Many nanotechnology applications, such as nanoimprint lithography and
insulation made...

...life cycle. Workers have the
potential to be exposed to large quantities of nanoparticles at
manufacturing , but in factory environments that can be tightly

controlled; consumers are unlikely ever to be...

...stage with the greatest uncertainty and need for more
research.
* Of $8 trillion in projected **manufacturing** output incorporating
nanotechnology through 2014, Lux Research calculates that 25% is
exposed to real **risk** at **manufacturing** , which should be easiest
to
mitigate. 7% is exposed to real **risk** at use, and 14% is exposed to
risk
at end-of-life. However, 40% is exposed to perceptual **risk** .

The report finds that nanotech EHS risks require specific actions from corporations, start-ups, investors...

6/3,K/10 (Item 10 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter
(c) 2005 Dialog. All rts. reserv.

42915381 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Nanotechnology's Environmental, Health, and Safety Risks Can Be Addressed Responsibly Today
PR NEWSWIRE (US)
June 15, 2005
JOURNAL CODE: WPRU LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 824

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... a threat regardless of whether or not it is real. Both are equally important in **gating** the progress of nanotechnology commercialization. * Many nanotechnology applications, such as nanoimprint lithography and insulation made...

...life cycle. Workers have the potential to be exposed to large quantities of nanoparticles at **manufacturing** , but in factory environments that can be tightly controlled; consumers are unlikely ever to be...

... stage with the greatest uncertainty and need for more research. * Of $8 trillion in projected **manufacturing** output incorporating nanotechnology through 2014, Lux Research calculates that 25% is exposed to real **risk** at **manufacturing** , which should be easiest to mitigate. 7% is exposed to real **risk** at use, and 14% is exposed to **risk** at end-of-life. However, 40% is exposed to perceptual **risk** .
The report finds that nanotech EHS risks require specific actions from corporations, start-ups, investors...

6/3,K/11 (Item 11 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter
(c) 2005 Dialog. All rts. reserv.

42743936
ARM Artisan Low Power IP Offered By IBM, Chartered To Support 65-Nanometer Common Platform
HUGIN

June 06, 2005
JOURNAL CODE: FHUG LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 671

... 2005 - ARM ((LSE:ARM); (Nasdaq:ARMHY)) today announced a collaboration with IBM and Chartered Semiconductor **Manufacturing** that makes available the ARM Artisan MetroO low-power platform for the IBM-Chartered 65...

...validates their continued commitment to be at the forefront of providing leading-edge design and **manufacturing** solutions. "Collaboration on process technology, IP and design methodologies are central themes in IBM's ...

... such as ARM, the common platform is increasingly recognized by semiconductor companies as a lower **risk** and more cost-effective business model to access advanced process and design technologies," said Kevin Meyer, vice president of worldwide marketing at Chartered. "Optimizing these technologies for world-class manufacturing with an open IP model that facilitates true multi-sourcing is a distinctive and compelling...

... advanced power management methodologies by providing library components such as voltage level shifters and power **gating** cells for use with both memories and standard cell blocks. "Solving technical problems across company...

... F for the fiscal year ended December 31, 2003 including (without limitation) under the captions, " **Risk** Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations," which...

6/3,K/12 (Item 12 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

42544600
IBM, Chartered Offer ARM Artisan Low-Power IP And High-Speed PHYS For 90-Nanometer Common Platform
HUGIN
May 25, 2005
JOURNAL CODE: FHUG LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 802

... May 25 2005 - ARM ((LSE:ARM); (Nasdaq:ARMHY)) today announced that IBM and Chartered Semiconductor **Manufacturing** are offering the ARM Artisan MetroO low-power platform and the ARM Artisan VelocityO high...

... ARM technology is an expansion of the companies' existing agreements to enable design compatibility and **manufacturing** flexibility for foundry Partners; the ARM Artisan physical IP solutions move sophisticated, low-power design...

... continue to broaden our relationship with ARM in support of our efforts to deliver integrated, **manufacturing** -aware, 90nm design solutions for the SoC design community." Artisan Low-Power Platform Extending ARM...
... advanced power management methodologies by providing library components

such as voltage level shifters and power **gating** cells for use with both memories and standard cell blocks. Front-end views for these...

... F for the fiscal year ended December 31, 2003 including (without limitation) under the captions, " **Risk** Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations," which...

6/3,K/13 (Item 13 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

42541634
ARM Artisan Low-Power IP For 130-Nanometer Process
HUGIN
May 25, 2005
JOURNAL CODE: FHUG LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 827

... advanced power management methodologies by providing library components such as voltage level shifters and power **gating** cells for use with both memories and standard cell blocks. Additionally the agreement provides for...

... copper, 0.13um copper, and mixed signal/RFCMOS. UMC is also a leader in 300mm **manufacturing** ; Fab 12A in Taiwan and Singapore-based UMCi are both in volume production for a...

... F for the fiscal year ended December 31, 2003 including (without limitation) under the captions, " **Risk** Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations," which...
? e au=kralik, b

Ref	Items	Index-term
E1	0	*AU=KRALIK, B
E2	1	AU=KRALIK, GABRIEL P
E3	1	AU=KRALIK, KAREN
E4	2	AU=KRALITZ, EVA R.
E5	1	AU=KRALJ, ALOJZ
E6	7	AU=KRALJ, BORIS
E7	2	AU=KRALJ, BRANIMIR
E8	1	AU=KRALJ, BRANIMIR L.
E9	1	AU=KRALJ, JANKO
E10	2	AU=KRALJ, TOMAZ
E11	3	AU=KRALJEVIC
E12	1	AU=KRALJEVIE, MAIRA A.

Enter P or PAGE for more
? e au=goldbach, m

Ref	Items	Index-term
E1	0	*AU=GOLDBACH, M
E2	1	AU=GOLDBACH, M J
E3	1	AU=GOLDBACH, MORTON
E4	1	AU=GOLDBACHER

```
E5         1  AU=GOLDBAGEN, JESSICA
E6         1  AU=GOLDBART, PAUL M
E7         1  AU=GOLDBART, STEPHEN
E8         4  AU=GOLDBAS, MICHAEL
E9         1  AU=GOLDBAUM
E10        1  AU=GOLDBAUM, ANDREW
E11        3  AU=GOLDBAUM, DAVID
E12      157  AU=GOLDBAUM, ELLEN

          Enter P or PAGE for more
? e au=dagum, p

Ref    Items  Index-term
E1         0 *AU=DAGUM, P
E2         1  AU=DAGUM, PAUL
E3         2  AU=DAGUPAN
E4         2  AU=DAGUSTUN
E5         2  AU=DAGUT, M.
E6         3  AU=DAGUT, MERTON
E7        21  AU=DAH
E8         1  AU=DAH-CHENG WOO
E9         1  AU=DAH, GEORGE DAH
E10        1  AU=DAHAB
E11        1  AU=DAHAB, A.S.
E12        1  AU=DAHAB, MOHAMED F

          Enter P or PAGE for more
? s e2
>>>One or more prefixes are unsupported
>>>  or undefined in one or more files.
      S7       1  AU='DAGUM, PAUL'
? t s7/3,k/all

 7/3,K/1     (Item 1 from file: 15)
DIALOG(R)File  15:ABI/Inform(R)
(c) 2005 ProQuest Info&Learning. All rts. reserv.

01048353  96-97746
Uncertain reasoning and forecasting
 Dagum, Paul ; Galper, Adam; Seiver, Adam; Horvitz, Eric
International Journal of Forecasting  v11n1  PP: 73-87  Mar 1995
ISSN: 0169-2070  JRNL CODE: IJF

 Dagum, Paul ...

01048353/9
DIALOG(R)File  15:ABI/Inform(R)
(c) 2006 ProQuest Info&Learning. All rts. reserv.

01048353  96-97746
Uncertain reasoning and forecasting
Dagum, Paul; Galper, Adam; Seiver, Adam; Horvitz, Eric
International  Journal  of  Forecasting  v11n1  PP:  73-87  Mar 1995  ISSN:
    0169-2070  JRNL CODE: IJF
DOC TYPE: Journal article  LANGUAGE: English   LENGTH: 15 Pages
SPECIAL FEATURE: Charts Graphs Equations References
GEOGRAPHIC NAMES: US
```

DESCRIPTORS: Probability; Forecasting techniques; Bayesian analysis; Time series; Health care; Studies; Mathematical models
CLASSIFICATION CODES: 2600 (CN=Management science/Operations research); 9130 (CN=Experimental/Theoretical); 8320 (CN=Health care industry)

ABSTRACT: A probability forecasting model is developed through a synthesis of Bayesian belief-network models and classical time-series analysis. By casting Bayesian time-series analyses as temporal belief-network problems, dependency models were introduced that capture richer and more realistic models of dynamic dependencies. With richer models and associated computational methods, one can move beyond the rigid classical assumptions of linearity in the relationships among variables and of normality of their probability distributions. The methodology is applied to the difficult problem of predicting outcome in critically ill patients. The non-linear, dynamic behavior of the critical-care domain highlights the need for a synthesis of probability forecasting and uncertain reasoning.

Set Items Description
S1 911 (SHORTAGE (3N) RISK) AND (SUPPLY OR DEMAND)
S2 62 S1 AND COMPONENT AND (MANUFACTURING OR PRODUCTION)
S3 20 S2 NOT PY>2000
? t s3/3,k/all

3/3,K/1 (Item 1 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

02522646 117543046
The cost of capital: perspectives for managers
Groth, John C.; Anderson, Ronald C.
Management Decision v35n6 PP: 474-482 1997
ISSN: 0025-1747 JRNL CODE: MGD
WORD COUNT: 6010

...TEXT: cycle (see Byers et al., 1997).

The cycle depicts the conversion of cash into the **production** process, then to goods and services and finally back to cash in the form of...

...one form to another entails evaluating expected returns and risks. For example, capital in the **production** process is at greater risk than holding cash. The cost of capital is the minimum...each provider of capital faces a different set of risk factors, the rate that they **demand** for the use of their capital will vary depending on the provider. Most companies obtain...

...0.25)(19%) + (0.30)(8%)
= 8.5% + 4.75% + 2.4 % = 15.65%

Estimating **component** costs

This paper defers details of estimating costs of the individual components of cost of...

...discussion of these issues awaits the next paper.

Uncertainty exists in the estimates of the **component** costs of the WCOC[7]. That prompts us to round the 15.65 per cent...capital within the economy. Those who have or generate capital export it to more favourable **risk** -return opportunities.

- The **shortage** of capital in these economies results in unusually adverse effects if the firm fails to...returns and risk. The COC is the minimum acceptable rate of return that one should **demand** before exposing capital to risk.

Notes

1We do face and make decisions in the context...

...causes us to direct readers to textbooks that provide a discussion of estimation methods of **component** costs.

8This perspective is appropriate for economic decisions. Special

considerations are appropriate for regulated industries...

3/3,K/2 (Item 2 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01771826 04-22817
VARs' reactions mixed as component **prices stabilize**
Howle, Amber
Computer Reseller News n827 PP: B21-B22 Feb 1, 1999
ISSN: 0893-8377 JRNL CODE: CRN
WORD COUNT: 1197

VARs' reactions mixed as component **prices stabilize**

...ABSTRACT: is stabilizing. Monitor prices should level off for the most part this year. The excess **supply** of CRT monitors is diminishing, while **demand** for LCD monitors is rising, resulting in much slower price declines and even a potential...

...not be able to get large quantities of specific brands and models. Thanks to growing **demand** for mid- to high-end PCs, microprocessor prices are stabilizing. Graphics card prices should continue...
...TEXT: white-box reseller Arizona Computers LLC.

Yaeger and other VARs have mixed feelings about stabilized **component** prices. While stabilization means easier forecasting, the downside is that it becomes harder to remain...

...DDR SDRAM.

Meanwhile, prices on 64-Mbyte DRAM are leveling off as vendors ramp up **production** of 128-Mbyte modules, Garber said.

Jim Handy, memory analyst at Dataquest, San Jose, Calif., added that **demand** for obsolete product is stable as supplies dwindle in favor of the PC-100 platform...

...this year, analysts said.

Barry Young, vice president of DisplaySearch, Austin, Texas, said the excess **supply** of CRT monitors is diminishing, while **demand** for LCD monitors is rising, resulting in much slower price declines and even a potential...
...Rhoda Alexander, senior market analyst for Stanford Resources Inc., San Jose, said the CRT monitor **supply** is evening out with **demand** , while LCD monitors, especially 15-inch models, face a greater **risk** of **shortage** due to increased **demand** .

The biggest problem resellers may face this year on the monitor side is they might...

...microprocessors, the market is nearly dominated by Intel Corp., Santa Clara, Calif.

Thanks to growing **demand** for mid- to high-end PCs, microprocessor prices

are stabilizing, according to Tony Massimini, chief...

3/3,K/3 (Item 3 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01737183 03-88173
The common law "duty to serve" and protection of consumers in an age of competitive retail public utility restructuring
Rossi, Jim
Vanderbilt Law Review v51n5 PP: 1233-1321 Oct 1998
ISSN: 0042-2533 JRNL CODE: AVLR
WORD COUNT: 39873

...ABSTRACT: provide adequate financing. It is doubtful that a sales or industry tax on electric power **supply** will be enacted in the near future, so for the time being regulators must take...
...TEXT: longer provide adequate financing. Instead, a national retail sales or industry tax on electric power **supply** may be necessary to fund access for low income customers. A national sales or power **supply** tax on electricity will likely prove the most efficient mechanism for enhancing access to utility...

...competition or contestability in power distribution, forcing explicit consideration of cross-subsidies, and minimizing power **supply** market distortions. It is doubtful, however, that such a tax will be enacted in the...Tripp maintained, however, that Frank's right to provide this service was limited to high- **demand** times, particularly days during which a regional market was operating in Kingston.41

When the...whereas other shippers were to pay thirty-five cents a barrel, and Standard enforced this **demand** by threatening to withdraw its entire business.46

Initially, only the state courts were active...the exercise of the power of eminent domain. Accordingly, a gas company is bound to **supply** gas to premises with which its pipes are connected." Mr. Cook, in his work on...

...says: "Gas companies, also, are somewhat public in their nature, and owe a duty to **supply** gas to all." . . . In the view of these authorities, we are constrained to hold that...

...to interconnect with its gas lines, despite the utility's allegation that it lacked adequate **supply** to meet existing customers. Writing for the court, Justice Hadley wrote:

The principle here announced...

...to aid the courts in holding that when a person or company has undertaken to **supply** a **demand** which is affected with a public interest, it must **supply** all alike who are like situated, and not discriminate in favor of nor against any...that is otherwise arbitrary and capricious.74

The United States Supreme Court acknowledged the extension **component** of the duty to serve in 1917 in New York ex rel. New York & Queens...

...proper discharge of this public duty required not only that the company should provide a **supply** of water and establish a system for its distribution to meet the reasonable needs of...

...view the prospective and probable increase in population of the municipality and the necessarily increasing **demand** for a water **supply** which would be consequent therefrom; to anticipate the natural growth of the municipality it had...

...as a whole and to take reasonable measures to have under its control a sufficient **supply** of water and make gradual extensions of its distributive system to meet the reasonable demands...

...determinations of the reasonableness of compelled extension: the company's duty, the adequacy of water **supply** for distribution, the adequacy of ...facilities burdened by extension, the rights of existing customers, the necessity of the company to **supply** the extension, and the effect of extension on existing customers.82 The court found that the water company had enough of a **supply** of water so that service could be extended to the new community without affecting water **supply** to current customers.83 Thus, the court concluded, by accepting a franchise and undertaking the...

...An isolated individual cannot compel an uneconomical addition to an area with a very low **demand** for service.85 Despite this, a recent New York court decision required service extension to...
...abandon if the utility can show it no longer has a franchise to serve, public **demand** is minimal, a shortage of supplies exists, operation is ...Circuit City would not exist if customers did not have circuitsll-and this may stimulate **demand** for electricity or natural gas. Moreover, as is discussed below, increasing the number of customers...

...pervasive access can be identified for these industries, they relate primarily to the costs and **supply** of network service, not to its **demand** value or the amount customers are willing to pay for universal service. To this extent...

...the regulated utility context.120

A firm is a natural monopoly if the entire market **demand** can be served at lower cost by a single firm than by two or more...far more efficient to use electricity as it is produced, requiring tight coordination between power **supply** and **demand** . Third, the transmission of electricity is sensitive to the generation input acting upon the grid...

...transmission; and second, individual generators cannot physically direct their output to any particular customer or **demand** point. A vertically integrated generation and transmission utility is able to economize on these technical...

...parties to any power pool. In return, though, customers must be guaranteed access to power **supply** and distribution services if they request it, as these services are bundled together and provided...

...the utility is protected by a liability rule, which allows customers to take service on **demand** in return for compensation, as determined through an elaborate ratemaking system.142 Effectively, service extension...more

profitable alternative comes along.146 For example, assume that a seller has agreed to **supply** all of a buyer's coal requirements for a twenty year period. The parties base...

...index. However, over time incidents such as oil embargoes and inflation cause the supplier's **production** costs to exceed the agreed index, so that if the seller continues to perform, it...

...use customer, the utility is the superior risk-bearer with respect to changes in the **supply** of electricity and the technological aspects of transmission and distribution. The customer, though, may be...

...a portion of the fixed costs of extension, which are built into the fixed cost **component** of their rates. However, contribution requirements, which the common law recognized and many states currently...rising fuel and environmental costs. Second, utilities began to exhaust economies of scale in power **production** ; power **production** was no longer considered a natural monopoly, but was viewed as competitive, or at least...

...changes in several respects. Reforms over the past ten years have been remarkable. Today, the **production** , or generation, sector of the industry is viewed as competitive (or at least contestable) and...

...most, remained paradigm natural monopolies-that is, they are services for which the entire market **demand** can be served at a lower cost by a single firm than by two or...

...competitive with nearly fifty major firms and many more small firms bidding to meet the **demand** for power.183 Unregulated power producers are now bearing many industry risks, such as the...structure allowed electric utilities to take advantage of operational and technical efficiencies in coordinating power **supply** and **demand** . However, vertical integration of generation, transmission, and distribution also risked reduced access to natural monopoly...
...on through their utility's rates, without retail competition, individual consumers do not have power **supply** options and must purchase their power from the incumbent utility. The incumbent utility, which in...

...the extent allowed by state law.199 Yet, as these larger customers benefit from retail **supply** options, smaller customers continue to bear the burden of financing generation assets the incumbent utility may have planned and built to meet the large customer **demand** . Without retail choice opportunities for all customers, smaller customers are at a significant risk of...

...and its primary role will be to use advanced metering equipment to ensure that power **supply** on its system is roughly equal to power demands at any given moment. However, under...the most economical way to use the industry's dispersed assets to meet total dispersed **demand** . They do this by shifting **production** from one well to another, processing from one refinery to another, and physical shipments from...

...cost of providing service, inhibits prices from increasing to market-clearing or rationing levels when **demand** exceeds available capacity. Under traditional rate regulation, some firms must have an obligation to maintain sufficient capacity to meet under-priced **demand** during such periods. A competitive regime would regard prices as technical

devices that the industry...

...payments for electricity traded. Such payments encourage developers to build generating capacity to meet peak **demand** .224 In Norway, where the electricity industry has also undergone significant de-integration beginning with...

...twenty-four hours, and are established by the Pool operator on the basis of individual **supply** and **demand** curves communicated electronically by market participants. The Pool also provides for instant market purchases, allowing participants (limited to producers that can deliver electricity on fifteen minutes notice) to adapt production to actual **demand** . After spot market prices have been set, market participants are informed of their individual prices and obligations (financial, not physical) for purchase, **production** , or sale. Discrepancies are settled in the instant market.226 New Zealand has instituted similar...utility duty to serve should be reassessed to fit the structure of a competitive power **supply** market. To the extent extraordinary service obligations are continued for natural gas and electricity in...

...supporting the perpetuation of extraordinary service obligations, extraordinary service obligations can facilitate access to power **supply** without undermining efficiency gains, despite the warnings of free marketeers who look askance at the...

...for new approaches to financing extraordinary service obligations. The introduction of competition will create a **demand** for distinct interim and longer-term mechanisms for financing the duty to serve.

Along these...

...SBC") on power distribution, unbundling or mandated use of a PoolCo power exchange to facilitate **supply** access, and properly set exit fees. The lesson of electricity markets is generalizable to other...

...telecommunications and natural gas: In these industries, too, unbundling or the development of a robust **supply** competitive market clearinghouse, such as the PoolCo, can work to minimize the structural inefficiencies of ...

...conclude that eventually power markets will need to apply taxation mechanisms to power consumption or **supply** in order to continue financing the duty to serve. If appropriately structured, financing mechanisms can... alternative suppliers, and competition in power generation will likely provide customers a range of power **supply** qualities.23 And, should a power distributor refuse to extend or continue service to a...

...monopoly service. Put another way, a single utility will continue to provide distribution to power **supply** for the large bulk of power customers. So, for most smaller customers who do not...customers seem relevant. It should be noted, though, that in a deregulated environment where power **supply** is competitive, the access and cost spreading rationales for the extension obligation apply to distribution service only, not to competitively provided power **supply** . Put another way, despite an economic rationale for requiring the DisCo to assume some distribution service extension obligation, economic analysis does not necessarily require the DisCo to also provide power **supply** . Thus, without further

exploration of the structure of retail power markets, there does not appear ...

...a strong economic rationale for requiring the DisCo to build generation facilities or procure power **supply** to serve customers. Nevertheless, to the extent regulators decide to impose basic service obligations on...

...a customer is able to pay the variable portion of the costs associated with the **supply** and distribution of power.255 This cost sharing advantage, however, is significantly reduced in a...

...service, but, absent excess capacity committed to DisCo customers, it does not apply to power **supply** .

Despite these structural and regulatory differences between a competitive market and the traditional regulated industry...

...that power markets may yield poor information. Assuming that customers have good information about power **supply** options and the terms of power **supply** sales contracts, when compared to the DisCo, the customer will be the superior bearer of the risks of service shut-off. The customer can purchase **supply** plans that provide for early warning or, if necessary, insurance to cover the risks of...

...to a loss of power. Many customers, though, may not have adequate information about power **supply** markets so as to react to the risks of shut-off, particularly where shut-off...

...to this information when some action, such as the purchasing of power insurance or backup **supply** options, is in order. Poor information or consumer discounting of risks may require the DisCo or a supplier to assume some service continuation obligation, even in a competitive power **supply** market. This will especially be true as these markets initially evolve and as regulators embark...

...exists in our market economy, the imposition of service continuation obligations in a competitive power **supply** market might work to mitigate the incentives the welfare system produces for taking excessive credit...to the extent they are repeatedly presented to low-income consumers in a competitive power **supply** market, will also increase the incidence of default, especially because utilities will not face the...

...competition and a movement to marketbased pricing, cross-subsidization will continue to exist, but power **supply** markets will require DisCos to minimize the impact of subsidies on customers or risk losing...

...of extraordinary service obligations to the DisCo the best way to ensure an efficient power **supply** , or should regulators attempt to find ways to shift some of the extraordinary service obligations...

...power and ensure reliability for incumbent customers? Will it have an obligation to provide power **supply** from generators it owns or operates, or should the DisCo have some other mechanism for shifting the **risk** of **supply** **shortage** to power suppliers or others? If the former should be the case, residential and small...services, while also passing through these efficiencies to the average consumer.

1. A Mandatory Power **Supply** Pool: Applying Extraordinary Service Obligations to Suppliers or Marketers of Power

A recent analysis of...

...DisCos, and possibly to marketers or brokers of power.

One mechanism to ensure adequate power **supply** for a DisCo to meet its basic service obligation is to create a basic service power **supply** pool. Pursuant to this approach, each GenCo that wishes to compete for basic service-including...

...DisCo, in turn, could draw from this pool to meet basic service needs. The mandatory **supply** pool has the advantage of providing a reliable source of power to meet basic service...

...DisCo in meeting its service obligations in competitive retail markets. The idea behind the mandatory **supply** pool is to unbundle DisCo-supplied power from distribution service, avoiding some of the incentives...

...to sell customers their own power rather than encouraging customer participation in the competitive power **supply** market.

So conceived, though, the mandatory **supply** pool has several drawbacks from an efficiency perspective. The mandatory basic service **supply** pool would provide no opportunity for basic service customers to participate in the market; basic...

...as to the benefits of retail competition or to encourage customer participation in competitive power **supply** markets.

A second problem with the mandatory basic service pool is that it risks price distortion in the power **supply** market. Because power suppliers would be required to contribute a portion of power to the...

...succeed if power were priced based on the spot market for power, but establishing a **supply** pool without setting up an appropriate market exchange would contribute to high levels of volatility...
...are significantly lower than the price of basic service.

A final problem with the mandatory **supply** pool, so conceived, is that it extends a portion of the power service obligation to...

...extraordinary service obligations by the generator. In fact, some states have already built extraordinary power **supply** obligations into their restructuring plans. For example, Illinois' restructuring legislation makes perhaps the strongest extension of extraordinary service obligations to power **supply** markets. In Illinois, prior to participating in the competitive retail power market, power suppliers must...

...to displace, essentially agreeing to maintain the incumbent utility's service obligations.264 Yet power **supply** is a structurally competitive market; bilateral contractual relationships between suppliers, customers, marketers, and brokers establish...default-a fall back option-for customers who opt not to participate in the power **supply** market. As with power **supply** markets, encumbering retail marketers or brokers with service obligations will thwart competition in these markets...

...the telcom context, such an approach would work to enhance consumer awareness of competition and **supply** competition for retail customers. An advantage of this approach over the mandatory power **supply** pool is that it allows customers to see changes in suppliers on their bills, thus...

...further, the ballot and spread approach may be an improvement over a mandatory basic service **supply** pool. One advantage is that customers, to ...availability of choice in the market. However, to implement the ballot and spread approach to **supply** allocation in retail electricity markets, regulators will need to address pricing of power selected via...

...for basic service and reducing the ability of DisCo-owned generation to compete in power **supply** markets. If the latter, this approach, like the mandatory pool, will extend some of the service obligation to power **supply** markets, risking distortion of the competitive power **supply** market.

3. DisCo Competitive Bidding with Cost Pass-Through

An alternative approach to meeting basic...

...part of its Standard Offer for customers who have not opted to enter into power **supply** arrangements with unregulated suppliers, DisCos are required to arrange for a "last resort" power supplier...
...be addressed with the bidding approach is the degree of continued regulatory oversight of power **supply** markets. To the extent regulators continue to evaluate the ability and cost of alternative suppliers...

...to hold power in reserve for basic service, reducing the amount of power in competitive **supply** markets, or may lock regulators into above-market prices pursuant to long-term contracts. 4...determination of power needs for basic service and facilitates subsidization of some of these power **supply** costs, including reserves, by DisCo customers who are not taking basic service. However, there is no reason for regulators to make these determinations in competitive power **supply** markets. Instead, the DisCo, which, out of physical necessity, is the provider of last resort...

...is in an excellent position to bear the risks of an increase in basic service **demand** , recover costs through the SBC, and avoid the costly errors that could be introduced by regulators' inaccurate prediction of power **supply** needs. Further, as with other proposals, cross-subsidization of basic service power **supply** by other DisCo customers is likely to introduce several distortions into the pricing of retail...

...power suppliers, the DisCo is the superior risk-bearer of an increase in basic service **demand** and is also in the best position to spread the costs of basic service. Any...

...power on the spot market.

5. Limiting the Obligation to the DisCo While Avoiding Strategic **Supply** Problems and Ensuring Adequate **Supply**

The mandatory **supply** pool, telcom, competitive bidding, and market share approaches each attempt through regulation to extend some...

...the governing body in states which have adopted retail wheeling

legislation or regulations. Yet, power **supply** and marketing have been recognized to be competitively structured, or at least contestable. This suggests...

...of extraordinary service obligations on these industry actors will lead to costly distortions in power **supply** markets. Unlike the DisCo, which every state continues to regard as a natural monopoly, none...

...of the duty to serve and, along with it, an obligation to procure competitive power **supply** to meet basic service needs. New Hampshire adopted an approach similar to this in early...to take the risks of price differences between the spot and long-term contract power **supply** markets. If a DisCo offers basic service at a price exceeding the spot market price ...

...generation does not act in an anti-competitive manner that discourages customer participation in power **supply** markets or favors its own power **supply** in basic service provision. To address such concerns, some states envision structural unbundling by prohibiting...

...or limiting the amount of affiliate power a DisCo can use to meet basic service **demand** .297 Presumably, such prohibitions and limits are designed to rectify the potential costs of DisCo...

...or controls transmission to the customer. However, such limitations can work to distort the power **supply** market by limiting the range of power **supply** options available to DisCos and, ultimately, may risk harming consumers with higher rates.

When a...

...there is clearly a potential for DisCo affiliate abuse or gaming in the provision of **supply** to meet basic service needs. The alternatives regulators have considered are designed to mitigate some...

...needs. The power exchange, unlike other approaches, will price based entirely on the market of **supply** and **demand** for power. If a DisCo is mandated to bid its power into the exchange before...

...be financed through an SBC, can work to simultaneously facilitate the development of robust power **supply** markets and pass the new efficiencies of these markets on to consumers without sacrificing access...the presence of de jure monopoly in power distribution, the availability of self-owned power **supply** for small- to medium-sized electricity customers will work to introduce de facto competition, as...

...imminent, pressures for dismantling the monopoly of power distribution are likely to evolve as retail **supply** markets become robust. At a minimum, power distribution will eventually be considered contestable and may...

...the history of utilities has been characterized by competition for service areas.30 As electricity **supply** becomes competitive it is likely that there will be enhanced competition even for markets regulators...
...markets will also work to minimize power market distortions, by facilitating customer access to power **supply** without the encumbrance of access, line, and exit fees.

With multiple distribution companies in a...

...to finance service obligations may be through a national sales tax on power distribution or **supply** , coupled with federal voucher and service extension grant programs to guarantee minimum service quality. Because of the potential for self-generation and distribution bypass, a tax on electricity **supply** , as opposed to power distribution, may prove the most efficient mechanism for financing the duty...

...excess burden of the tax. In addition, imposition of a direct consumption tax on power **supply** allows for revenue collection regardless of the distribution route, effectively providing for revenue even where... to allow DisCos and suppliers to deduct any taxes built into the prices for power **supply** purchased as an input to the power generation, transmission, or distribution process. Like the consumption...

...states take different approaches to financing utility service obligations.
The regressive nature of these power **supply** taxation options is obvious. However, they are no more regressive than traditional utility pricing and ...

...content of traditional utility service. Yet, as the natural monopoly model is abandoned for power **supply** , continuation of these extraordinary service obligations will require regulators to articulate new intellectual justifications, perhaps...

...this Article has also argued that application of extraordinary obligations should not extend to power **supply** or marketing. As compared to price regulation, which masked many discussions about cross-subsidies, competitive...

...a basic service obligation on the DisCo, to be fulfilled through voluntary procurement of power **supply** and financed through an SBC, minimizes the inefficiency of imposing a service obligation in a...

...that also own or operate generation. Although it may be desirable, mandated divestiture of power **supply** is not necessary; instead, an unbundled market with an efficient **supply** exchange clearinghouse, based on the PoolCo model, and properly set exit fees can minimize the...
...such as the establishment of a national sales tax or an industry tax on power **supply** , if society is willing to make a commitment to such a tax. Such a tax...wheeling is allowed de jure by states, large commercial and industrial customers have retail power **supply** choices pursuant to federal law. See infra Part III.A.

Footnote:

17. See Benjamin A...

...for purposes of promoting consumer protection may also be applicable to environmental programs, such as **demand** -side ...is the important issue regulators will face in the near future. Privately owned public utilities **supply** nearly 80 percent of the power supplied today in the United States. See PETER Fox...

...number of private suppliers of electricity will grow, due to enhanced incentives for entering power **supply** markets and a movement away from public ownership of power generation.

Footnote:
In Jackson v...

...at 646 (stating that a public duty will arise only "when there is a reasonable **demand** for it and a reasonable extension of the service can be made to meet the **demand** "); see also Colonial Prod. Co. v. Pennsylvania Pub. Util. Comm'n, 146 A.2d 657...is 'a basic underlying obligation of a city owning a general domestic utility system to **supply** impartially all applicants who are in substantially like position to those being served").

88. See...

...and choose its customers solely on the basis of pecuniary advantage

Footnote:

and refuse to **supply** those who constitute an integral part of the locality simply because, considered in isolation, their...

...that a lengthy extension was unreasonable).

97. See, e.g., DiSanto v. Dauphin Consol. Water **Supply** Co., 436 A.2d 197, 200 (Pa. Super. Ct. 1981) (noting that regulatory commission has...price mechanisms. A firm simply bypasses (or internalizes) the system of market prices and coordinates **production** without the use of explicit prices. See Ronald Coase, The Nature of the Firm, 4...exchange within their interconnected member systems and establish reliability criteria for system interconnections and power **supply** . Together, these nine regional groups form the North American Electricity Reliability Council ("NERC"), whose members...

...what regulators call a "capacity charge"-the cost of maintaining reserve capacity to ensure reliable **supply** .

Footnote:

140. See PHILLIPS, supra note 138, at 62-63, 176-80.

141. Richard A...

...Co., 583 S.W.2d 721, 728 (Mo. Ct. App. 1979) (enforcing a contract to **supply** a public utility with coal despite an unprofitable bargain for seller).

Footnote:
148. See Paul...

...constitute breach).

Footnote:

149. See Richard E. Speidel, Court-Imposed Price Adjustments Under Long-Term **Supply** Contracts, 76 Nw. U. L. Rev. 369, 381-94 (1981)

(discussing efficiency); see also Richard...environmental regulation of electricity generation remains heavy. See Scott F. Bertschi, Integrated Resource Planning and **Demand** Side Management in Electric Utility Deregulativn.: Public Utility Deregulation: Public Utility Panacea or a Waste...

...of increasing returns to scale (i.e., declining average cost) over the relevant range of **production** . See supra note 121.

176. Public Utilities Regulatory Policies Act of 1978, Pub. L. No...as independent buyers and sellers of electricity. Brokers bear none of the risk associated with **supply** obligations while traders bear the contractual, risk of meeting **supply** similar to present utility obligations to serve their customers.
218. See Navarro, supra note 215...

...1994, at 24.

221. Similarly, the overnight bank rates central banks use manage the money **supply** and exchange rates. Even though interest rates in the banking system may occasionally surge to...Part II.C.1.

Footnote:

229. Since FERC's Order No. 888, wholesale access and **supply** competition occur under FERC's open access policies, which require a transmission utility to offer...

...and suppliers at terms and conditions comparable to the service it offers its own power **supply** . During prior times, competition at the wholesale level may have had potentially adverse impacts on...25, 28 (Pa. Pub. Util. Comm'n 1997) (requiring generators, marketers, and brokers wishing to **supply** services in Pennsylvania to apply for a license, but leaving universal service issues for regulators...39-1-27.3(d).

Footnote:
285. Price caps, of course, go largely unrecognized when **supply** is adequate. However, should there be a severe short- or long-term shortage in generating...fees, such as Representative Delay's restructuring bill, may be inconsistent with an efficient power **supply** market providing universal customer access. See H.R. 4297, 104th Cong. 3(b) (1996) (banning...also require regulators to find new financing mechanisms, such as a national power consumption or **supply** tax.

Author Affiliation:

* Assistant Professor and Patricia A, Dore Professor of State Administrative Law, Florida...

3/3,K/4 (Item 4 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01407575 00058562
Simulation of woodyard inventory variations using a stochastic model
LeBel, Luc; Carruth, J Steven

Forest Products Journal v47n3 PP: 52-57 Mar 1997
ISSN: 0015-7473 JRNL CODE: FPJ
WORD COUNT: 3779

...DESCRIPTORS: **Supply** chains

...ABSTRACT: applied to model logging contractors' output rates. Trial runs for a theoretical mill and wood **supply** system indicated that placing a buffer of 2 days of **production** between harvesting and trucking operations significantly reduced the number of the days the papermill would experience low inventories. It was therefore possible to decrease the **risk** of wood **shortage** at the papermill without having to increase the number of suppliers. Benefits and limitations of...
...TEXT: costs of logging capacity and inventory is largely an analysis of risk under which the **production** and capacity utilization of loggers, mill demands, inventory levels, **production** of by-product, and weather impacts are all important. A probabilistic spreadsheet model was written...

...applied to model logging contractors' output rates. Trial runs for a theoretical mill and wood **supply** system indicated that placing a buffer of 2 days of **production** between harvesting and trucking operations significantly reduced the number of days the papermill would experience low inventories. It was therefore possible to decrease the **risk** of wood **shortage** at the papermill without having to increase the number of suppliers. Benefits and limitations of the approach are discussed.

Pulp and paper industries depend on a reliable wood fiber **supply** to maintain operations. Running out of wood at most papermills is an expensive and generally...

...between mills vary, all mills have to deal with the relationship between wood consumption, wood **production** , and wood inventory in order to have fiber when they want it.

Despite major technological...
...it is not unusual for logging contractors to lose 10 to 20 percent of their **production** capacity to adverse weather conditions (7). Wet weather may force a logger to stop inwoods...

...that are too muddy and soft to use for hauling. Facing such variability on the **supply** side, companies often choose to contract their logging operations to a large number of producers...

...the woodyard. This paper documents how a spreadsheet can be used to simulate alternative wood **supply** scenarios and evaluate the risks and benefits associated with different levels of inventory and logging...

...inventory levels between a minimum and a maximum level without having to resort to imposing **production** quotas on a large group of suppliers.

OBJECTIVES

1. Develop a model that simulates a...

...logging force to help the mill maintain stable woodyard inventories while minimizing the need for **production** quotas.
MODEL DEVELOPMENT

The model was developed on Quattro Pro Windows version 5.0. A...

...and available to most wood procurement managers. For example, the number of suppliers and their **production** capability, inventory targets at the mill, and the buffer size allowed between the harvesting and...

...individual vendors (logging contractors) are placed on a weekly basis, and reflect both the current **demand** from the mill and the actual quantity of wood in storage in the mill woodyard...their output level (surge).

It is typical for logging contractors to send part of their **production** to other markets. The user is therefore allowed to divert part of the supplier's **production** to an alternate market (market siphon). In the present case, 25 percent of the loggers' **production** does not reach the papermill. Our model does not treat the siphon as a value...

...upper limit. More specifically, Type I loggers are those that have invested heavily in high- **production** equipment. Their daily **production** capacity is 375 tons (approx. 15 loads). Their ability to increase **production** (surge) when needed is set to be equivalent to 1 extra day (375 tons) per...

...Type III loggers are the company "fire squad;" when needed, these loggers can significantly increase **production** by using older, paid-off equipment. Goldratt and Cox (5) would consider them as bottleneck...

...DOWNTIMES AND SYSTEM EFFICIENCY

The impact of weather is the most unpredictable variable facing the **supply** side of wood procurement in the South. Any model that attempts to evaluate wood **supply** risk must incorporate a method for simulating the largely unpredictable nature of bad weather, both...

...and buffer size. In the present context, failure rates strictly reflect the frequency with which **production** is lost due to adverse weather. Recovery time is the expression of the time in...

...the woods and hauling operations and define some inventory buffer between the two. The third **component** of E , buffer size, is the inventory amount, measured in days worth of **production** , which is allowed to accumulate at the deck or roadside between the harvesting and hauling...the probability that a logging system will work on any given day. Since wood orders, **production** , and inventory are adjusted on a weekly basis, a cumulative probability function must be defined...

...generated for a time horizon of 52 weeks. Tables 4 and 5 summarize how weekly **production** and consumption are computed. The first column shows the weekly wood order from the mill...

...each run, new random values are generated following a uniform distribution. This is an important **component** of the model since the success of a Monte Carlo simulation is largely dependent on...

...number of days worked times the number of loggers in the category times the daily **production** capacity gives the total **production** . For example, in week 4, Type I loggers: 375 tons/day x 3 days x 11 loggers = 12,375

tons. The summation of the weekly **production** for each three types gives the total volume of roundwood produced.

Part of the roundwood...

...lucrative markets such as sawmills and plywood mills often purchase a share of the loggers' **production** . Accordingly, in the column called "Market Siphon" in Table 5, the loggers' total **production** is reduced by 25 percent. The roundwood must then be debarked and processed into chips...

...our logging force without using surge capacity is thus shown under the column called "Chip **Production** ."

The change in inventory level is obtained by subtracting the mill's weekly consumption from...

...or "trigger" level, special wood orders are placed, and loggers are asked to increase their **production** output. Loggers would be asked to produce at surge level until the inventory is back...

...loggers need a minimum of three workable days during the week to deliver any surge **production** , Type II loggers need 4 days, and Type III loggers only need 2 days. These...can be used as a tool to help loggers get the most out of their **production** capacity. A simple stochastic model such as the one presented may go a long way...

...2-day inventory between harvesting and trucking. The increase in efficiency yielded a more reliable **supply** of wood fiber to the papermill. It was observed that woodyard inventories were less likely...
...Va.

Reference:

2. Askin, R.G. and C.R. Standbridge. 1993. Modeling and Analysis of **Manufacturing**

Reference:

Systems. John Wiley and Sons, Inc. New York

Reference:

3. Buzacott, J. 1971. Methods of reliability analysis of **production** systems subject to breakdowns. In: Operations Research and Reliability. Daniel Grouko, ed. Gordon and Breach...

...Planning and Analysis. 3rd ed. McGraw-Hill Inc. New York.

7. LeBel, L.G. 1993. **Production** capacity utilization in the southern logging industry. M.S. thesis. Virginia Polytechnic Inst. and State...

3/3,K/5 (Item 5 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00729999 93-79220

Market analysis via judgemental modelling: An application in the UK chemical industry
Naude, Pete; Lockett, Geoff; Gisbourne, Steve
European Journal of Marketing v27n3 PP: 5-22 1993
ISSN: 0309-0566 JRNL CODE: EJM
WORD COUNT: 6279

...TEXT: most important recent developments relate to environmental pressure, especially concerning the solvents emitted during subsequent **manufacturing** processes. There are currently no substitutes, and although there is a long-term threat from...

...85 to 90 per cent of the local industry's needs, and almost the total **production** is bought by about ten different firms. The trend towards companies choosing to reduce the...

...for this diversity of purchase loyalty seemed the usual one of attempting to spread the **risk** in times of **shortage** and to "keep the suppliers on their toes" in a buyer's market.
METHODOLOGY

To...means that these subsequent buyers are able to squeeze the profit margins of all their **component** suppliers, making the investment cost and working capital implications of any lost **production** even higher. As one respondent said: "The industry is run by the end producers. The...as a technique to keep the suppliers competitive and to spread the risk of non-**supply** in times of shortfall in the industry. In addition, there seemed to be a recognition...M., "Resource Management and Strategic Decision Making in Industrial R&D Departments", Engineering Costs and **Production** Economics, Vol. 20, 1990, pp. 219-29.

25. Belton, V. and Vickers, S.P., "VISA...

3/3,K/6 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

06105508 Supplier Number: 53683686 (USE FORMAT 7 FOR FULLTEXT)
Firm Prices Not Always Bad -- VARs' Reactions Mixed As Component **Prices Stabilize.(Company Business and Marketing)**
Howle, Amber
Computer Reseller News, p21B(1)
Feb 1, 1999
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1245

Firm Prices Not Always Bad -- VARs' Reactions Mixed As Component **Prices Stabilize.(Company Business and Marketing)**
... white-box reseller Arizona Computers LLC.
Yaeger and other VARs have mixed feelings about stabilized **component** prices. While stabilization means easier forecasting, the downside is that it becomes harder to remain...

...DDR SDRAM.
Meanwhile, prices on 64-Mbyte DRAM are leveling off as vendors ramp

up **production** of 128-Mbyte modules, Garber said.

Jim Handy, memory analyst at Dataquest, San Jose, Calif., added that **demand** for obsolete product is stable as supplies dwindle in favor of the PC-100 platform...

...this year, analysts said.

Barry Young, vice president of DisplaySearch, Austin, Texas, said the excess **supply** of CRT monitors is diminishing, while **demand** for LCD monitors is rising, resulting in much slower price declines and even a potential...

...Rhoda Alexander, senior market analyst for Stanford Resources Inc., San Jose, said the CRT monitor **supply** is evening out with **demand** , while LCD monitors, especially 15-inch models, face a greater **risk** of **shortage** due to increased **demand** .

The biggest problem resellers may face this year on the monitor side is they might...

...microprocessors, the market is nearly dominated by Intel Corp., Santa Clara, Calif.

Thanks to growing **demand** for mid- to high-end PCs, microprocessor prices are stabilizing, according to Tony Massimini, chief...and drive prices are still plummeting.

For VARs that excel at finding the best prices, **component** price stability can cut their competitive edge.

3/3,K/7 (Item 2 from file: 16)

DIALOG(R)File 16:Gale Group PROMT(R)

05386594 Supplier Number: 48190268 (USE FORMAT 7 FOR FULLTEXT)

Clouds put damper on growth forecast

Ryan, Margaret

Electronic Engineering Times, p1
Dec 22, 1997
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1668

... of interest rates, the appreciating U.S. dollar, the assertions of an information-technology labor **shortage** and the **risk** of inflation further cloud analysts' and economists' forecasts.

Businesses that derive a large portion of...

...to inflation late next year.

A more immediate concern, according to some economists, is weak **demand** for U.S. exports.

Lower U.S. exports

Economist John Huizinga, a professor at the...

...third quarter, U.S. real net exports fell 21.6 percent.

Nonetheless, Huizinga believes domestic **demand** will be sufficient to expand the U.S. economy by 2.5 percent in 1998-provided the United States has the productive capacity to meet the **demand** for goods and services.

Labor shortages could threaten that productivity. The domestic

unemployment rate stood...

...on Korean capital investments "could actually help the semiconductor industry" by closing the gap between **supply** and **demand** .
But Thomas Kurlak, chip-industry analyst for Merrill Lynch, believes the industry is grinding towardEquipment for 300-mm-wafer **production** on pilot lines will be among the stronger sellers, according to Dornseif. But the equipment...

...forecasts 15 percent to 20 percent unit growth through the year 2000, owing to declining **component** costs, expanding corporate and consumer **demand** , and growth in international markets. But the firm expects the United States and Europe, not...
INDUSTRY NAMES: BUSN (Any type of business); ELEC (Electronics); ENG (Engineering and **Manufacturing**)
NAICS CODES: 334413 (Semiconductor and Related Device **Manufacturing**)

3/3,K/8 (Item 3 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

02523024 Supplier Number: 43338286 (USE FORMAT 7 FOR FULLTEXT)
Nitrotec - cleaner surface engineering
Metallurgia, pCHT1
Oct, 1992
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1222

... need for an oxidising salt bath and mineral oil.
2 Processed gases from a bulk **supply** system are utilised, reducing the need for generated gases from continuous generators that produce carbon ...

...mild and low-alloy steels by various alternative treatment options. A detailed consideration of a **component** such as a piston operating in the hydraulic or gas suspension system of a road...

...Until the 1980s the only way of meeting effectively the design requirements for such a **component** was to make the piston from a low-alloy steel, carburise case-harden to enhance...
...application. It should be noted that when electroplating is carried out on a hardened steel **component** it should be followed by a low-temperature hydrogen de-embrittlement treatment. In addition to...treatments use only non-strategic materials and replacement of chromium and nickel plating removes the **risk** of future **shortage** and escalating cost of these two imported metals, the removal of chromium by grinding to...

...However, nothing is perfect, and when the 'death knell' finally sounds for a Nitrotec treated **component** , it is readily recyclable.
EVENT NAMES: *320 (**Manufacturing** processes)

3/3,K/9 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

12622098 SUPPLIER NUMBER: 65379502 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Understanding intraday credit in large-value payment systems.(Fedwire and CHIPS - Clearing House Interbank Payments System)
Zhou, Ruilin
Economic Perspectives, 24, 3, 29
Fall, 2000
ISSN: 0164-0682 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 11917 LINE COUNT: 00956

... with the two sides of the main conflict; the model should incorporate both settlement liquidity **shortage** and credit **risk** , preferably generated endogenously by agents' choice or action.
The existing theoretical research on payment systems...

...all four proposed criteria. It mostly focuses either on liquidity or risk and rarely models **demand** for settlement liquidity as a derived **demand** . Nevertheless, the literature provides significant insights into the merits of the three intraday-credit policies...assumption that there is no need or opportunity to optimize the timing of consumption and **production** over the course of a single "day." A "day" can be interpreted as any length...
...understand this, let us consider the complete life cycle of a funds transfer. Suppose a **manufacturing** company I purchases $10 million worth of computer equipment and services from company II. The...The concern for whether there will be a sufficient account balance to cover outgoing payments **demand** may raise the level of precautionary reserves that each ban k holds (above reserve requirements), given the uncertain **demand** for payment. Therefore, the need for settlement liquidity in real time may be very costly...makes borrowing and lending intraday settlement liquidity necessary. Last, the model should include the risk **component** : the possibility of settlement failure that could be triggered by genuine bank failure (for example...

...settlement liquidity or on credit risk, rarely both. Most models ignore the reality that the **demand** for settlement liquidity is a derived **demand** for underlying trade of goods and financial assets (criteria 1 and 2). Despite their problems...

...be achieved through a market mechanism (see Mengle et al., 1987, and Evanoff, 1988). The **demand** for intraday credit is assumed to derive from the fundamental difficulty of synchronizing payment flows...

...reserve balances for settlement and the need for potentially costly precise-timing contracting). On the **supply** side, it is argued that the providers of settlement liquidity should be compensated for its...

...value of settlement liquidity to both sides of the market gives rise to the standard **demand** and **supply** and, hence, market clearing price. This argument is plausible heuristically. The challenge is to model explicitly the elements that determine the **demand** and **supply** for settlement liquidity and to evaluate the argument in a rigorous way. Some of the...

...from borrowing intraday) renders the distortionary reserve requirement non-binding. For banks whose payment liquidity **demand** is smaller than the reserve requirement, the distortion created by the non-interest-bearing reserve...

...borrowing banks is necessary, and requires compensation. Rochet and Tirole (1996) focus on the risk **component** of the cost to the supplier of intraday liquidity, and argue that the primary problem...offers different insights about the provision of intraday credit. To separate the problems of liquidity **shortage** and settlement **risk** , I first discuss a version of the model that only has a shortage of settlement...Z.sub.2), purchase unredeemed debt from those in group Y at par (since the **demand** for debt is greater than the **supply**) and settle the purchased IOUs with late-arriving debtors. In this case, the asynchronization of...

...amount of fiat money in the economy intraday, but does not change the aggregate money **supply** overnight. Hence, the action does not alter the inflation path on both the C-good...too costly, in particular when total funds in reserve and clearing accounts are in short **supply** . Furthermore, even with potential aggregate default risk, the provision of free intraday liquidity by the...P.sub.Dt).

The debt discounting rate ((rho).sub.t+1) is determined by the **demand** and the **supply** of the unredeemed debt,

16) ((rho).sub.t+1) = min {1,(alpha)(lambda)/(1-(lambda...

3/3,K/10 (Item 2 from file: 148)

12156744 SUPPLIER NUMBER: 62003520 (USE FORMAT 7 OR 9 FOR FULL TEXT)

Public Investment, Social Services and Productivity of Chinese Household Farms.

DONG, XIAO-YUAN

Journal of Development Studies, 36, 3, 100
Feb, 2000
ISSN: 0022-0388 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 9776 LINE COUNT: 00954

... diversification of the economy, and reopening of markets, brought about a rapid increase in agricultural **production** in the early 1980s (Fan, 1991; Lin, 1992). While the commune system was abolished during the reform process, it would be mistaken to interpret the shift to household **production** as an outright rejection of the village co-operative economy (Nee and Su, 1990; Zhu...

...new resources to upgrade rural infrastructure, provide services in the areas of irrigation, technical guidance, **production** co-ordination, processing and marketing, and sponsor social programmes such as primary education, health care, pensions, and welfare. By contrast, in the regions where agricultural **production** predominates village economies, the decollectivisation of farming practice has deprived local governments of direct control...

...well recognised in the development literature (see, for instance, Timmer (1988); Todaro (1997)). Although agricultural **production** does not display strong economies of scale, the growth of small household farms in developing...

...Chinese farmers overcome their weaknesses in these key areas, thereby promoting sustained growth in agricultural **production** . Such arguments

have frequently been raised by observers of Chinese agriculture (Nee and Su, 1990...

...As a result, these villages have shifted the focus of their economic activities from agricultural **production** to industrial and commercial undertakings. The four type-II villages, most of these located in...7)

As elsewhere in China, all the sample villages had abandoned the practice of team **production** and restored family farming as the basic form of agricultural **production** by the end of 1983. As land farmed collectively in the 1960s and 1970s was...

...the total income of a household, nearly 70 per cent of which came from crop **production** (see Table 1).

Following the trend observed throughout China, the sample villages experienced substantial improvements in **production** , sales, and income from 1979-84, but saw a sharp decline in agricultural **production** in 1985 and 1986. Although the cutbacks of state investment in agriculture, the declining prices...

...drought were believed to be the direct causes of this downturn, the instability of agricultural **production** has drawn attention to the problems associated with the lack of well-developed markets in...

...been oriented toward the need of collective farms, was not adjusted adequately to meet the **demand** of small-scale household farming. While market activities in factor inputs were officially tolerated, the...

...systems, rural electrification, roads, and storage, (2) providing services in the areas of technical guidance, **production** coordination, crop protection, input supplies, processing, marketing, and other pre- and post- **production** services, and (3) sponsoring social programmes such as primary education, health care, and welfare. The...

...guidance, helping households purchase farm inputs and market their products, installing tap water, increasing the **supply** of electrical power, providing day-care services, contributing to local schools, and building village libraries...collective in the other two types of villages where the economy was dominated by agricultural **production** . Because the scope of developing non-agricultural enterprises was limited, the collectives in those villages had the difficulty of finding new resources to replace the revenues from the agricultural **production** which they no longer directly controlled. As a result, the fees paid by households, which ...

...these two types of collective expenditures are expected to have a positive impact on farm **production** . This is because these activities provide farm households with the goods and services that the markets have often failed to **supply** either due to the absence or inadequate development of markets in the post-reform Chinese...

...a rapid expansion of markets observed in the post-reform era, most households still oriented **production** towards basic self-sufficiency. Although self-sufficiency

may be seen as a rational response by...

...the marketing rate of grain output and the share of income generated by non-crop **production** activities in household operational revenue are used

as proxy variables for the degree of specialisation and commercialisation of a farm household. The first variable measures specialisation in crop **production** , which was the main activity of the majority of farm households in the sample. The...

...level is likely to affect the productivity of farm households through its impact on agricultural **production** , because, as mentioned previously, crop **production** remained the major undertaking of farm households, despite the rural economic diversification. Theoretically, industrialisation is...not be transferred freely across rural communities. The negative impact of rural industrialisation on agricultural **production** was exacerbated by the low return to crop **production** as compared with that to other occupations due to the rapid growth in the prices...

...the effects of public expenditures of village collectives on the productivity of farm households using **production** function regressions. (12) The Cobb-Douglas **production** function model we shall use is specified as follows:

(y.sub.it) = (alpha) + (r.sub...

...14) the rate of grain marketing (RGM), the share of household revenue from non-crop **production** (SHRNCP), and the share of non-agricultural income in village GVP (SNAI), (alpha), (rho), (gamma...

...u.sub.i) + (v.sub.it) (2)

where (u.sub.i) is a household-specific **component** , and (v.sub.it) represents statistical noise. The (u.sub.i) captures those characteristics of the **production** function in each household that are omitted from the equation, but do not vary over time. Since the explanatory variables of the **production** function are likely to be correlated with the unobserved, household-specific effect, (u.sub.i...

...alternative to fixed-effects estimation is to treat the household-specific effect as a random **component** and estimate equation (1) by the generalised least squares (GLS) method. In the presence of...

...non-agricultural household activities but excludes the income generated by the activities outside of household **production** , such as wage employment. (15) Except for grain quota sales, which were valued at state ...

...adjusted to avoid an overestimation of the labour input that was actually used in household **production** because an appreciable proportion of household labourers took wage employment in collective and private enterprises...

...produced by a household, measured in kilograms. The share of household revenue from non-crop **production** activities, SHRNCP, is one minus the ratio of revenue from crop **production** to ...estimation procedure outlined above assumes that public expenditures of village collectives are exogenous to household **production** . However, one can argue that a positive correlation between public expenditure and household **production** may reflect the fact that the villages that have more productive farm households are able to invest more in public services. A strong reversed causality between household **production** and public expenditures could be observed if funds supporting public projects came mainly from household...

...than those in the village where the collective sector was weak or collapsed, holding the **supply** of public good and services constant. The Hausman test of the null hypothesis that the...

...null hypothesis at any conventional level of significance. Hence, the issue of endogeneity of household **production** and public expenditures was ignore d in the estimation.

IV. THE RESULTS

Table 5 presents ordinary least squares (OLS), random effects (GLS) and fixed-effects (LSDV) estimates of the **production** function. Lagrange multiplier and Hausman tests are performed to test the specifications of the random...

...The sum of the four output elasticities is equal to 0.884, indicating that the **production** of farm households displayed decreasing returns to scale in private inputs.

As expected, household output...

...the rates of grain marketing, RGM, and the share of household revenue from non-crop **production** , SHRNCP. According to the estimates of these variables, a one per cent increase in RGM...

...productivity of farm households, while rural industrialisation appears to have an adverse effect on the **production** of farm households.

The estimates of public investment and social service expenditures show that these public activities have a positive impact on household **production** . The output response to a change in the value of each public expenditure variable is...by farm households is not surprising, given the lack of funds and means to diversify **risk** , and **shortage** of manufactured farm inputs facing

Chinese peasants, as indicated by the various household surveys described...

...increa se in public spending in these areas could significantly raise the profitability of household **production** . While both private and collective funds appeared to have been allocated inefficiently, the problem of...in the areas of village infrastructure and service provision would boost the profitability of household **production** even more for the households in the agricultural villages and, particularly, the low-income agricultural...

...richer villages, which could raise adequate funds from publicly-owned industrial enterprises to subsidise agricultural **production** , the expenditures of the sample villages on public investment and social services were substantially below...

...The improvement in the distribution network of irrigation, marketing, technological extension, other pre- and post- **production** services, health care, and primary education could lead to an upsurge in agricultural productivity in...

...had increased to 2.18 million, covering approximately 80.7 per cent of the former **production** teams (The Task Force of Rural Cooperative Economies, 1996). It is noteworthy that in the...

...collectively own farmland and some productive capital assets, but do not directly engage in crop **production** .

(2.) A nationwide survey showed that in 1990, village co-operatives provided Chinese peasants with...Cooperative Economic Study Group, 1996).

(10.) Separate measures of current expenditures on pre- and post-**production** services and on social programmes are unavailable in the published village surveys. As a measure...

...land. Some households even left their contracted land fallow because the expected returns to crop **production** could not match the opportunity costs of labour in local markets.

(12.) Although the cost...

...which made no public service expenditures.

(15.) While all the sample households engaged in agricultural **production** , 12 to 15 per cent of these households were reported to have also undertaken some...

...used in household non-farm activities from the output and input variables used in the **production** function regression because of the data limitation. Thus, precisely, the **production** function regressions of this paper estimated the average relation between the output produced by and the inputs used in the household activities which were dominated by agricultural **production** , and other factors which may have affected the productivity of household **production** .

(16.) For a typical household in the sample, 28.2 per cent of total household...

...Admittedly, this assumption may lead to underestimates of the use of labour input in farm **production** because the same unit of labour is likely to generate more income from wage employment...

...time lag, and current services, such as crop protection and machine-ploughing, which affect household **production** concurrently. The dynamics of human capital-related activities were not explored in the present study...Oxford: Oxford University Press.

Binswanger, H. and Mark Rosenzweig, 1986, 'Behavioral and Material Determinants of **Production** Relations in Agriculture', Journal of Development Studies, Vol.22, No.3, pp.503-17.

Bowles...

...5, pp.915-28.

Fan, Shenggen, 1991, 'Effects of Technological Change and Institutional Reform on **Production** Growth in Chinese Agriculture', American Journal of Agricultural Economics, Vol.73, No.2, pp.266...

...Rural Economic Research References, No.8, pp.33-40.

Schmidt, Peter and Robin Sickles, 1984, ' **Production** Frontier and Panel Data', Journal of Business and Economic Statistics, Vol.2, No.4, pp

27.09) (13.73)				
Among agriculture:				
Crop **production**	67.98	74.01	68.94	64.00
	(18.46)	(14.33)	(15.94)	(22...

...36

	(7.07)	(1.52)	(1.2)	(8.44)
Share of labour engaging in crop **production** (%)	59.0 (20.7)	37.4 (9.6)	55.1 (22.2)	73.7 (8...

...yuan per household) 21.77
% of expenditures 31.45

DESCRIPTIVE STATISTICS
OF VARIABLES USED IN
PRODUCTION FUNCTION
REGRESSIONS

	All households	Type-I villages	Type-II villages
Output (yuan)	2,705.2...		
...16.8)			
Share of household revenue from non-crop **production** activities	31.6 (28.1)	19.2 (27.9)	30.9 (28.2)
(%) Share of non-agricultural	35.5	75.9...	
...marketing rate (%)	8.3		
	(7.8)		
Share of household revenue from non-crop **production** activities	38.5 (25.8)		
(%) Share of non-agricultural income in village GVP (%)	27.8 (12.7...		

...Note: HINCOME is gross revenue of household operation, that is, the dependent variable of the **production** function regression. CINCOME is gross revenue of collective undertakings per household in a village. CLABOUR...

...per household in a village. PI is public investment, and SSE is social service expenditures.

PRODUCTION FUNCTIONS: OLS, GLS, AND LSDV ESTIMATES
DEPENDENT VARIABLE = LOG (OUTPUT)

Model:	OLS		GLS	
	Coefficient	t...		
Marketing	0.003	6.138	0.003	6.812
Share of revenue from non-crop **production**	0.006	17.926	0.006	18.975
Share of non-agricultural income in village...				
...407 30.323				
Grain Marketing	0.003	6.301		
Share of revenue from non-crop **production**	0.007	16.566		
Share of non-agricultural income in village GVP	-0.005	-6...		

3/3,K/11 (Item 3 from file: 148)

11774668 SUPPLIER NUMBER: 58174729 (USE FORMAT 7 OR 9 FOR FULL TEXT)
City size, diversification and income smoothing.(US cities)
Lamorgese, Andrea
National Institute Economic Review, 170, 99(7)
Oct, 1999
ISSN: 0027-9501 LANGUAGE: English RECORD TYPE: Fulltext; Abstract

WORD COUNT: 5172 LINE COUNT: 00425

... same location firms give workers the incentive to settle at the site, thereby reducing the **risk** of **shortage** of labour **supply** during booms. By the same token, pools of workers of homogeneous skills attract firms to...

...knowledge spillovers, pecuniary externalities, and Marshallian local economies. Centrifugal forces are the spatial dispersion of **demand** , competition in products and factors markets, and high transportation costs.
The theoretical literature (Krugman, 1991b...

...equilibrium of counteracting forces which meet in the market. Increasing returns to scale, indivisibilities in **production** , and vertical linkages in the input-output matrix are centripetal forces, while competition among producers in the markets for inputs and/or outputs, spatial dispersion of **demand** , and high transportation costs are centrifugal forces. The balance of these counteracting forces determines the...smooth fluctuations in aggregate income of a certain location, which imply fluctuations in aggregate local **demand** and employment (centripetal force). The smoothing is achieved through risk-sharing and diversification which bring...

...this externality represents the centripetal force of urban agglomeration, while the general equilibrium effect of **demand** in the markets for labour pushes agents away from each other and pulls towards dispersion...

...section is to provide a framework for decomposing income volatility among its components where each **component** has a different underlying evolution through time. The fact that the different components move out... of corporate officers. Proprietors' income (with inventory valuation and capital consumption adjustments) is the current- **production** income (including income in kind) of sole proprietorships and partnerships and of tax-exempt cooperatives...earnings, although the reduction in volatility is less than others have found looking at the **component** states of the USA.
Contributions to social security and transfer payments are the most important...
...pp. 139-52.
Davis, D.R, and Weinstein, D.E. (1998), 'Economic geography and regional **production** structure: an empirical investigation', Staff Reports 40, Federal Reserve Bank of New York.
----- (1999), 'Does...

3/3,K/12 (Item 4 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10783104 SUPPLIER NUMBER: 53683686 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Firm Prices Not Always Bad -- VARs' Reactions Mixed As Component Prices Stabilize. (Company Business and Marketing)
Howle, Amber
Computer Reseller News, 21B(1)
Feb 1, 1999
ISSN: 0893-8377 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1330 LINE COUNT: 00105

Firm Prices Not Always Bad -- VARs' Reactions Mixed As Component **Prices Stabilize.(Company Business and Marketing)**
... white-box reseller Arizona Computers LLC.
Yaeger and other VARs have mixed feelings about stabilized **component** prices. While stabilization means easier forecasting, the downside is that it becomes harder to remain...

...DDR SDRAM.
Meanwhile, prices on 64-Mbyte DRAM are leveling off as vendors ramp up **production** of 128-Mbyte modules, Garber said.
Jim Handy, memory analyst at Dataquest, San Jose, Calif., added that **demand** for obsolete product is stable as supplies dwindle in favor of the PC-100 platform...

...this year, analysts said.
Barry Young, vice president of DisplaySearch, Austin, Texas, said the excess **supply** of CRT monitors is diminishing, while **demand** for LCD monitors is rising, resulting in much slower price declines and even a potential...

...Rhoda Alexander, senior market analyst for Stanford Resources Inc., San Jose, said the CRT monitor **supply** is evening out with **demand** , while LCD monitors, especially 15-inch models, face a greater **risk** of **shortage** due to increased **demand** .
The biggest problem resellers may face this year on the monitor side is they might...

...microprocessors, the market is nearly dominated by Intel Corp., Santa Clara, Calif.
Thanks to growing **demand** for mid- to high-end PCs, microprocessor prices are stabilizing, according to Tony Massimini, chief...and drive prices are still plummeting.
For VARs that excel at finding the best prices, **component** price stability can cut their competitive edge.

3/3,K/13 (Item 5 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

09976876 SUPPLIER NUMBER: 20112451 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Clouds put damper on growth forecast. (semiconductor industry) (Industry Trend or Event)
Ryan, Margaret
Electronic Engineering Times, n986, p1(2)
Dec 22, 1997
ISSN: 0192-1541 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1753 LINE COUNT: 00144

...ABSTRACT: may also discover that their products will become less price-competitive in international markets. Weak **demand** for US exports is also an immediate concern, according to economists.
... of interest rates, the appreciating U.S. dollar, the assertions of an information-technology labor **shortage** and the **risk** of inflation further cloud analysts' and economists' forecasts.
Businesses that derive a large portion of...

...to inflation late next year.
A more immediate concern, according to some economists, is weak **demand** for U.S. exports.
Lower U.S. exports
Economist John Huizinga, a professor at the...

...third quarter, U.S. real net exports fell 21.6 percent.
Nonetheless, Huizinga believes domestic **demand** will be sufficient to expand the U.S. economy by 2.5 percent in 1998-provided the United States has the productive capacity to meet the **demand** for goods and services.
Labor shortages could threaten that productivity. The domestic unemployment rate stood...

...on Korean capital investments "could actually help the semiconductor industry" by closing the gap between **supply** and **demand** .
But Thomas Kurlak, chip-industry analyst for Merrill Lynch, believes the industry is grinding towardEquipment for 300-mm-wafer **production** on pilot lines will be among the stronger sellers, according to Dornseif. But the equipment...

...forecasts 15 percent to 20 percent unit growth through the year 2000, owing to declining **component** costs, expanding corporate and consumer **demand** , and growth in international markets. But the firm expects the United States and Europe, not...

...INDUSTRY CODES/NAMES: ENG Engineering and **Manufacturing**

3/3,K/14 (Item 6 from file: 148)

09201677 SUPPLIER NUMBER: 19022062 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Optimal order policies in assembly systems with random demand **and random supplier delivery.**
Gurnani, Haresh; Akella, Ram; Lehoczky, John
IIE Transactions, v28, n11, p865(14)
Nov, 1996
ISSN: 0740-817X LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 9011 LINE COUNT: 00766

Optimal order policies in assembly systems with random demand **and random supplier delivery.**

...AUTHOR ABSTRACT: assembly problem where two critical components are required for assembly of the final product, the **demand** for which is stochastic. The components can be ordered separately from individual suppliers or in...

...sells complete sets. The supplier delivery process may be random owing to uncertainty in the **production** process (e.g., semiconductor industries). We assume that a supplier, with probability (Beta) (say), supplies...
...order policy. The policies are intuitive and offer a better understanding of the effect of **supply** and **demand** uncertainty on the assembly problem.

With the growing popularity of 'Just-in-time' (JIT) **supply** and an increasing awareness of the benefits of close buyer-supplier relationships, many purchasing firms...

...by a firm (also referred to as the buyer) to assemble the final product, the **demand** for which is stochastic. We consider the case where the assembly stage is free, i...

...assemble the product). The process of procuring the components is fraught with uncertainty because the **production** process of the suppliers is uncertain (e.g., semiconductor industries). The procurement problem is further...

...multiple components are required in a certain ratio. If a supplier fails to deliver a **component** at the required time, the assembly process may get disrupted owing to mismatch in the...

...the option of coordinated ordering. Any inventory generated owing to mismatch in the supplier's **production** process is not passed on to the purchasing firm.

The nature of the delivery process can be uncertain if the suppliers have an uncertain **production** process leading to yield losses. The actual response of the supplier to the buyer's...

...multi-period setting. This work extends the results in Schmidt and Nahmias (1985) to include **supply** uncertainty. Furthermore, we consider the effect of dual sourcing on the optimal inventory policies. There exist some other situations when the **supply** contract specifies delivery in two shipments, see Moinzadeh and Lee (1989). Here the first shipment...

...in the second shipment. As a result, the buyer faces the combined effect of random **supply** quantity and uncertain leadtime.

In the analysis of the model, starting with the single-period...

...a single-period problem for a serial system with random yield at each stage, deterministic **demand** and no setup costs. Under certain conditions on the processing, holding and shortage costs, they...et al. (1988) consider a periodic review single-period model with random yield and random **demand** and show that the optimal order point is unaffected by the yield distribution. However, the...
...structure are also discussed. In another paper, Karmarkar and Lin (1986) consider a multi-period **production** planning problem in which **demand** and yield is random. Using the Lagrangian relaxation method, upper and lower bounds on the cost function are obtained. Finally, Bassok and Akella (1991) study a two-stage **production** and inventory problem, for a single part type, with uncertain **demand** and a service-level constraint on the **supply** . They jointly optimize **production** and **component** ordering decisions and demonstrate the savings by using the integrated model.

Gerchak and Parlar (1990...

...buyer of dealing with either or both suppliers. Anupindi and Akella (1993) discuss diversification under **supply** uncertainty for a single **component** in a two-supplier case with random **demand** . They derive conditions under which diversification will occur and show that the optimal order policy...

...Ramasesh et al. (1991) compare sole versus dual sourcing with stochastic lead time and known **demand** . A comparison of total expected costs suggests that when the uncertainty in lead times is...

...the problem of choosing optimal lot sizes in assembly systems with random yield at the **component** , and possibly at the assembly, stage. In a single-period setting, they solve two models...

...the first model, they consider components with identical costs and yield distributions, with a random **demand** distribution. Next, they consider components with non-identical costs and yield distributions, but with perfect assembly stage, and derive optimality conditions for the special case of two components with known **demand** . The emphasis in Gerchak et al. (1994) is on random quantity (yield) produced compared with...

...3. Model formulation

We consider a periodic review assembly problem where there is a stochastic **demand** for a final product which is assembled from two critical components. Without loss of generality...

...order quantities to get an equivalent model. Supplier (S.sub.i), i = 1,2, delivers **component** i, with probability ((Beta).sub.i) in the period, and with probability (1 - ((Beta).sub...

...1,2;

w = order quantity from supplier S;

(I.sub.j) = initial inventory level of **component** j, j = 1, 2;

((Beta).sub.i) = probability that supplier (S.sub.i) delivers the...

...of a set from supplier S;

(h.sub.j) = unit holding cost per period of **component** j, j = 1,2;

(Pi) = unit shortage cost;

M((w.sub.1), (w.sub.2...

...sub.1), (I.sub.2)) = optimal single-period cost;

f((center dot)) = density function of **demand** ;

F((center dot)) = cumulative distribution function of **demand** .

Also we define

(Alpha) = 1 - (Beta);

((Alpha).sub.i) = 1 - ((Beta).sub.i), i = 1...are not affected by this assumption as the analysis can be easily extended when the **component** holding costs are not identical. Furthermore, we assume that ((c.sub.i) + h) (greater than...

...and (c + h) (greater than) 0 so that it is never optimal to order any **component** with the intention of salvaging it.

3.2. Single-period cost formulation

In this section...

...carefully formulated. It includes the case when (i) the number of sets made exceeds the **demand** , and the case when (ii) there is a mismatch in the quantity of the components...

...can be written as

E (absolute value of Difference in end-of-period inventory of **component** 1 and 2),

where

(Mathematical Expression Omitted),

and E((center dot)) is the expectation operator...

...or equal to) (w.sub.2) + (I.sub.2). This implies that the inventory of **component** 1 exceeds that of **component** 2 on receipt of the order quantity from the individual suppliers. Next we can solve...

...deliver (this is with probability (Alpha)((Beta).sub.1)((Beta).sub.2)), and if the **demand** for sets exceeds ((w.sub.2) + (I.sub.2)), the excess number of **component** 1 is ((w.sub.1) + (I.sub.1) - (w.sub.2) - (I.sub.2)). Otherwise the excess number of components 1 and 2 is ((w.sub.1) + (I.sub.1) - **demand**) and ((w.sub.2) + (I.sub.2) - **demand**) respectively. The rest of the terms can be explained similarly.

(Mathematical Expression Omitted).

3.2...

...Intuitively, in the single-period problem, we do not expect to order excess parts of **component** 2 (compared with **component** 1) and pay the additional holding cost due to mismatch in the inventory levels. Therefore ...to) 0, (w.sub.1) (greater than) 0. (6)

However, if the inventory level of **component** 1 exceeds the threshold level, no order would be placed with supplier (S.sub.1...

...double prime)).

4.1. Solution to problem (P(prime))

We determine the threshold level for **component** 1, say (x.sub.1), such that, if (I.sub.1) (greater than or equal...of a supplier depends on the unit price, whereas the order quantity depends on other **supply** characteristics such as reliability of delivery. It is, however, important to note that this condition...

...As we see later in the proof of the theorem, if the inventory level of **component** 2 is below a critical threshold, it is optimal to diversify and place an order...

...is defined in Fig. 2. Intuitively, the policy is as follows. If the inventory of **component** 1 exceeds (x.sub.1), no order is placed with supplier (S.sub.1). However, **component** 2 may still be required. We then solve problem (P(double prime)) to obtain (w...

...under which the joint supplier is not used. This happens when the inventory level of **component** 2 exceeds another threshold, say (x.sub.2). We then show that the optimal policy...

...because it reduces the computational complexity of the problem. However, if the inventory level for **component** 2 is less than (x.sub.2), it is optimal to order from the joint...

...initial inventory level ((I.sub.2) (less than) (x.sub.2)), the firm faces the **risk** of high **shortage** costs if supplier (S.sub.2) does not deliver in the period. Hence it is...Omitted). Because both the components are required in equal quantity in the assembly process and **component** 1 is not ordered, getting an excess quantity of **component** 2 (compared with the inventory level of **component** 1) from supplier (S.sub.2) would only create a mismatch. Therefore we consider the...

...Remark: The order policy structure can be explained as follows: If the inventory level of **component** 2 exceeds (y.sub.1), no order is required. In the medium range ((y.sub...

...only. This is because ordering sets from the joint supplier results in additional parts of **component** 1. (Note that the inventory level of **component** 1 exceeds threshold (x.sub.1) and therefore there is no order from supplier (S.sub.1)). However, if the inventory level of **component** 2 is low ((I.sub.2) (less than) (y.sub.2)), it is optimal to...

...the joint supplier to hedge against the failure of supplier (S.sub.2) to deliver **component** 2. The excess holding cost of **component** 1 is traded-off with the shortage cost of not meeting the **demand** if supplier (S.sub.2) did not deliver. The results are described in Fig. 3...

...of the single-period problem. However, it may be optimal to order more of one **component** type in the current period for use in the future. The decision to diversify would...

...initial inventory level was below a critical threshold.

Because we consider the case that the **demand**0 is back ordered, any **demand** that is not met in the current period is carried forward to the next period...

...if any, are placed with the suppliers and are delivered with a certain probability. The **demand** for the period is then realized and the total costs are computed for the periodMathematical Expression Omitted) = initial inventory level of **component** i in period n, i = 1,2;

(d.sup.n) = **demand** for the assembled product in period n, n = 1, ..., N;

(Mathematical Expression Omitted) = total expected...

...Section 3.2.1) do not include the probability of delivery. Another consequence of the **supply** process is that the optimal cost-to-go is not directly affected by the **supply** uncertainty in the current period, because any unfulfilled order is delivered by the beginning of...

...in Theorem 5.3. Intuitively, in the second case, there is excess initial stock of **component** 1 (as compared with **component** 2). However, unlike the last period analysis, it may still be optimal to order component 1 for use in future periods.

We now discuss some properties of the cost function...

...need not be equal, i.e., it might be optimal to order more of one **component** type (thereby creating a mismatch in the inventory levels) for use in the future. We...cost function assuming that (Mathematical Expression Omitted). Intuitively, this means that the initial inventory of **component** 1 is greater than the inventory of **component** 2 after ordering **component** 2 in the current period. In the single-period analysis, this condition was sufficient to prove that it is optimal not to order **component** 1. However, in the dynamic analysis, it might still be optimal to order **component** 1 for use in future periods. We first write the first-order conditions and then...

...the two-period problem. The optimal order-up-to levels for each period and each **component** are calculated. In the single (last)-period problem, the order-up-to levels are obtained...

...in (11) and (12).

The variables used in the computational study are as follows:

1. **Demand** for the final product is assumed to be Uniform (0, 4000).

2. Holding cost per **component** per period is equal to 5.

3. Shortage cost per set per period is equal...be identical. They are 2757 and 2661 for components 1 and 2 respectively. Because the **supply** model in the paper assumes delivery in the current period or in the next period...

...the expected shortage cost is also reduced.

In case 2, the probability of delivery of **component** 1, ((Beta).sub.1) is reduced to 0.7. Because the probability of mismatch in... ...the joint supplier in the last period. Note that the order-up-to level for **component** 2 is also higher to reduce the expected holding cost of mismatch between the components...

...Conclusions

In this paper we determine optimal order policies for an assembly problem where the **demand** for the final product is stochastic. We consider a **supply** contract with delivery in a single shipment with the uncertainty in the timing of the...

...use in the future. This result is a direct consequence of the uncertainty in the **supply** process. We also observe that dual sourcing (ordering from the joint supplier as well) is...

...valuable comments and suggestions. We also thank Professor Candace Yano for her comments on different **supply** contracts. H.G. also thanks Professor Zvi Drezner for his comments on the convexity results...

...and by IBM contract number 19540046.

References

Anupindi, R. and Akella, R. (1993) Diversification under **supply** uncertainty. Management Science, 39(8), 944-963.

Bassok, Y. and Akella, R. (1991) Combined **component** ordering and **production** decisions in **manufacturing** systems with **supply** quality and **demand** uncertainty. Management Science, 37(12), 1556-1574.

Heyman, D. and Sobel, M.J. (1984) Stochastic...

...37(3), 341-354.

Gerchak, Y., Vickson, R.G. and Parlar, M. (1988) Periodic review **production** models with variable yields and uncertain **demand** . IIE Transactions, 20(2), 144-150.

Gerchak, Y., Wang, Y. and Yano, C.A. (1994) Lot sizing in assembly systems with random **component** yields. IIE Transactions, 26(2), 19-24.

Karmarkar, U. and Lin, S. (1986) **Production** planning with uncertain yields and **demand** . Working Paper, William E. Simon Graduate School of Business Administration, University of Rochester.

Lee, H.L. and Yano, C.A. (1988) **Production** control in multi-stage systems with variable yield losses. Operations Research, 36(2), 269-278... P. and Nahmias, S. (1985) Optimal policy for a two-stage assembly system under random **demand** . Operations Research, 33(5), 1130-1145.

Treleven, M. and Schweikhart, S.B. (1988) A risk...

...Operations Management, from Carnegie Mellon University, Pittsburgh, USA. His primary research interests are in enterprise **supply** chain management and multi-plant coordination, total quality management, logistics development and the analysis of the management of logistics projects, stochastic modeling and the impact of uncertainties on **manufacturing** systems, and **manufacturing** /marketing strategy. He has received several

awards, including The William W. Cooper Award for the...

...involve applied probability theory with emphasis on models in the area of computer, communication and **manufacturing** systems. In addition, he is the senior member of the CMU Advanced Real-Time Technology...

INDUSTRY CODES/NAMES: ENG Engineering and **Manufacturing** ;
...DESCRIPTORS: **Manufacturing** industry

3/3,K/15 (Item 7 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

06204944 SUPPLIER NUMBER: 13573384 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Nitrotec - cleaner surface engineering. (Contract Heat-Treatment)
Plumb, S.A.
Metallurgia, v59, n10, pCHT1(2)
Oct, 1992
ISSN: 0141-8602 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 1270 LINE COUNT: 00107

... need for an oxidising salt bath and mineral oil.
2 Processed gases from a bulk **supply** system are utilised, reducing the need for generated gases from continuous generators that produce carbon ...

...mild and low-alloy steels by various alternative treatment options. A detailed consideration of a **component** such as a piston operating in the hydraulic or gas suspension system of a road...

...Until the 1980s the only way of meeting effectively the design requirements for such a **component** was to make the piston from a low-alloy steel, carburise case-harden to enhance...
...application. It should be noted that when electroplating is carried out on a hardened steel **component** it should be followed by a low-temperature hydrogen de-embrittlement treatment. In addition to...treatments use only non-strategic materials and replacement of chromium and nickel plating removes the **risk** of future **shortage** and escalating cost of these two imported metals, the removal of chromium by grinding to...

...However, nothing is perfect, and when the 'death knell' finally sounds for a Nitrotec treated **component** , it is readily recyclable.

...DESCRIPTORS: **Production** management

3/3,K/16 (Item 8 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

06204928 SUPPLIER NUMBER: 13573784 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Multiple energy supply **risks, optimal reserves, and optimal domestic** production **capacities.**
Zweifel, Peter; Ferrari, Matteo
Energy Journal, v13, n4, p115(15)
Oct, 1992

ISSN: 0195-6574 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 4413 LINE COUNT: 00345

Multiple energy supply **risks, optimal reserves, and optimal domestic** production **capacities.**

TEXT:

...cope with these risks, oil can be stockpiled as well as domestic capacity for power **production** built up. Adopting the viewpoint of a policy maker who aims at minimizing the expected cost of security of **supply** , optimal simultaneous adjustments of oil stocks and electric **production** capacities to exogenous changes such as economic growth are derived. Against this benchmark, one-dimensional...

... correlated risky energy supplies, some implications of general decision rules that focus on one energy **supply** only. For example, is it optimal to increase domestic capacities of electric power **supply** if the **risk** of an oil **shortage** is expected to increase, without any regard of the costs and benefits of holding oil reserves? Not too surprisingly, it turns out that decision rules focusing on a single risky **supply** not only are suboptimal at a given point of time but also run the considerable...

...checklist of factors that determine the optimal amount of reserves of a good in uncertain **supply** , a simple objective function for dealing with two risky energy sources is developed. Next, decision...

...energy sources considered. The last section offers a few conclusions.

THE ECONOMICS OF SECURITY OF **SUPPLY**

Economic theory can be used to put together a checklist of factors that are important...

...determination of the optimal amount of reserves to be held in the face of uncertain **supply** (Henze, 1983):

1. The higher the decision maker's subjective valuation of welfare in a...

...crisis relative to the welfare loss incurred in the guise of resources spent on securing **supply** in normal times, the more he should invest in security of **supply** ;

2. The higher time preference, the less one should optimally invest in future security of **supply** ;

3. The higher the degree of risk aversion, the more one would want to avoid...

...the more one would like to invest in stabilization of welfare, e.g. through safe **supply** ;

4. The higher the estimated probability of disruption, the higher the amount of reserving;

5. The greater the degree of adaptability of domestic **production** , the less one would want to rely on reserves of any sort;

6. The longer...

...6. In particular, important economic losses cannot be avoided if a simultaneous disruption of foreign **supply** of another source of energy such as electricity should occur. While such simultaneous shortfalls may...

...measure of probability for smaller, more trade-dependent nations like Italy or Japan, whose electricity **production** relies to more than 60 percent (50 percent, respectively) on imported oil, followed by Greece...

...Balances, several years). For these countries, a scenario can be envisaged as follows: Domestic electricity **production** may run low due to failure of some large nuclear plant or a draught limiting...

...least because of a war in the Middle East (case of no correlation) or withhold **production** , taking advantage of the situation (case of positive correlation). Thus, a simultaneous shortfall of more than one energy **supply** is a real possibility in these countries.

OPTIMIZING RESERVES: SOME BASIC CONSIDERATIONS

This section is...

...for oil and electricity, abstracting from other energy sources as well as nonenergy factors of **production** . It is appropriate to state the simplifications that will be formally introduced later on:

1...

...the costs of prevention and the one-period expected GDP loss in case of a **supply** disruption |see e.g. Mork and Hall (1981) for estimates of GDP loss in the a disruption of oil **supply** is given by the weighted average of conditional probabilities, |p.sub.O/E

and |Mathematical...

...Omitted

.

|Mathematical Expression Omitted

|p.sub.O/E

: Conditional probability of a disruption of oil **supply** given that there is a disruption of electricity **supply**

|p.sub.E

: Probability of a disruption of electricity **supply**

|Mathematical Expression Omitted

: Probability of a disruption of oil **supply** , given that there is no disruption of electricity **supply** .

TABULAR DATA OMITTED

This means that |p.sub.O

depends on |p.sub.E

, causing the two events, "disruption of oil **supply** " and "shortfall of electricity" to be correlated.

Losses in terms of GDP will of course...

...oil and electricity are disrupted simultaneously (|L.sub.OE

).

The GDP loss of an oil **supply** disruption can be lowered by an increase in stocks (S), with decreasing returns at the...

...differences between increasing stocks of an imported energy source and increasing capacity of domestic energy **production** . First, stocks normally do not themselves influence the probability of occurrence of a disruption, although...

...for electricity does not serve to mitigate GDP loss due to a shortfall of power **supply** . These considerations suggest the following assumptions:

|Mathematical Expression Omitted

K: Domestic capacity of electric power **production** .

In order to introduce a severity ranking in a most simple way, the GDP

loss...

...the two decision variables being S (stocks of oil) and K (domestic capacity of power **production**). By increasing K and/or S, the policy maker can reduce the expected GDP loss in case of a **supply** shortage. However, by doing this, he would also run into some other costs with certainty. Building up stocks uses space and capital, while making additional capacity for electricity **production** available has become costly because of local resistance against the siting of new (nuclear) power...
...S
Marginal cost of oil stocks (assumed constant)
|pi.sub.K
: Marginal cost of domestic **production** capacity (assumed constant).
First, it must be admitted that this objective function is much more
...

...market oriented ones, time of day pricing can be used to shift peaks in power **demand** , which may also decrease reliance on risky supplies of electricity, while insulation of homes is...

...stands for the covariance of the two binary variables |B.sub.E
(disruption of electricity **supply** , yes/no) and |B.sub.O
(disruption of oil **supply** , yes/no); see appendix. With regard to oil shocks, one obtains
|Mathematical Expression Omitted
In...at the international level (in particular, as suggested by IEA) tends to focus on one **supply** risk at a time, resulting in what may be dubbed one-dimensional decision rules such...

...be mimicked by holding constant the decision variable S and varying capacity of domestic power **supply** K. In these artificial "optimal" conditions, how would domestic capacity for electricity **production** be adjusted? For analyzing this issue in the framework of the model, let there be...

...growth, resulting in increased losses of GDP in the case of a disruption of electricity **supply** . Therefore, equation (8) can be used to determine how the dependent quantity |Mathematical Expression Omitted...

...while remaining negative. This adjustment will call for an increase of domestic capacity for power **production** |cf. the assumptions introduced in the context of equation (3)
. Adjusting **production** capacity in the wake of economic growth conforms with intuition; however, closer inspection of equation...

...public interest. It should be noted that all of these findings also hold when the **supply** risks are independent because setting |c.sub.OE
= 0 leaves equation (10) qualitatively unchanged.
Another exogenous shock likely to spark adjustments of domestic capacity of power **production** is an increase in the likelihood of another oil crisis. This can take the form...

...the second case. If adjustment is again required to involve only domestic capacity for power **production** , abstracting from the opportunities offered by oil stocks, one has, from equation (8) the following...

...sub.E
goes towards zero. In other words, under rather realistic conditions, an increased oil **supply** risk would justify increased efforts at securing domestic capacity of power **production** in this constrained, one-dimensional analysis. However, the amount of adjustment would again depend positively on |pi.sub.K
, the marginal cost of additional capacity for power **production** . Thus, once more this type of one-dimensional policy can be of but limited rationality...

...one-risk-at-one-time policy of industrial countries with regard to security of energy **supply** , we now turn to a more global approach by admitting of simultaneous adjustment of both domestic capacity of power **production** K and of oil stocks S. It will be shown that even if the two **supply** risks are uncorrelated, K and S must be set in a coordinated fashion. Again, economic...a simultaneous shortfall of both sources of energy. Indeed, the counter-intuitive reaction of decreasing **production** capacity is conceivable if the GDP loss caused by the shortfall of electricity **supply** (|L.sub.E
) exceeds the limit given above, while |Mathematical Expression Omitted
is large. These findings do not depend on the degree of (positive) correlation between **supply** risks, while taking account of the functional dependence of |p.sub.O
on |p.sub...

...worthwhile if |Mathematical Expression Omitted
has a small value, indicating a situation where additional domestic **production** capacity does little to enhance security of **supply** .
This discussion should not be understood to suggest that capacity adjustment and stockpiling are mutually...

...In fact, if the GDP loss (|L.sub.E
) due to an interruption of electricity **supply** remains below the bound stated in equation (15) and (16), **production** capacity and oil reserves should both be increased in reaction to higher losses |L.sub...

...OE
) will also be large, ceteris paribus |see equation (4)
. Since domestic capacity of power **production** does not contribute to reducing these losses, decreasing their second **component** through additional oil reserves remains a viable alternative -- if its effect on the aggravation factor...

...In conclusion, equations (15) and (16) show that a more globally oriented policy of energy **supply** security would have to take into due account a few parameters that hardly have entered...

...far. For example, the changing effectiveness of a continuing capacity build-up for domestic power **production** |Mathematical Expression Omitted
and the changing effectiveness of additional stockpiling of oil |Mathematical Expression Omitted...

...go well together. In energy too, there is a trade-off between the security of **supply** on the one hand and the cost of stockpiling imported energy and of building up domestic capacity of **production** on the other. With both national policies and recommendations by the International Energy

Agency ("oil reserves for 90 days") focusing on one **supply** risk at a time, this trade-off is unlikely to be the least-cost one...

...one source of energy at a time towards an approach capable of dealing with simultaneous **su**pply risks and their specific properties.
APPENDIX
This appendix purports to show that the difference between...

...proportional to the covariance between the two binary variables, |B.sub.E
(= 1 if electricity **supply** is interrupted, resulting in loss |L.sub.E
, = 0 otherwise). Formally, the statement reads |Mathematical...auf die Elektrizitatsversorgung der Schweiz 1979-1990 (Sechster Zehn-Werke-Bericht) (Perspectives on Swiss Electricity **Supply** , 1979-1990, Report of the Ten Utilities), June.
Wirl, F. (1989), Optimal Capacity Expansion of...

3/3,K/17 (Item 9 from file: 148)

05926907 SUPPLIER NUMBER: 12826047 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Money men survey market mosaic. (excerpts from Petroleum Economist's annual round table discussion on energy finance) (Financing World Energy: A Special Supplement to Petroleum Economist) (Panel Discussion)
Petroleum Economist, v59, n6, pS58(5)
June, 1992
DOCUMENT TYPE: Panel Discussion ISSN: 0306-395X LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT
WORD COUNT: 5257 LINE COUNT: 00386

... and more vigour in appraising different development concepts, such as the possible use of floating **production** systems. The industry is grappling with the harsh economic climate, and potentially profitable development opportunities...to take a larger share of financings, at a time of shortage of capital. But **demand** has grown and the size has grown. The availability of liquidity has, until recent times...

...18 months ago, but nonetheless relatively favourable conditions for borrowers, because of reduced general loan **demand** during the recession.
Q A number of recent transactions have been oversubscribed in syndication. Some...a little too ambitious or were unlucky with their timing.
McTiernan: Because of increased loan **demand** , and less time to consider complexities or unfamiliar risks, banks have been able to pick...

...the five- to 15-year maturity sector in their portfolio. I gather that the European **component** of the US private placement market is growing very strongly in response to that. It...be a problem with the independents, I don't know, but there is no absolute **shortage** of exploration or **risk** -bearing oil industry money to finance any kind of reasonable proposition that a host government...us?" When you talk to the Siberian provincial government and you go and see the **production** association, they say, "Why are you talking to the provincial government?" But, given time, they...

3/3,K/18 (Item 10 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05570196 SUPPLIER NUMBER: 11772267 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Industry laying groundwork for work in next century; reaction to 1989-1991 events produces subtle changes in business climate. (includes related articles) (petroleum industry forecast)
LeBlanc, Leonard
Offshore, v51, n12, p28(2)
Dec, 1991
ISSN: 0030-0608 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 1145 LINE COUNT: 00094

The 1989-1991 period proved four things: (1) Crude oil **supply** is just as flexible as **demand** . (2) Oil and gas are strategic commodities, but not everyone realizes that. (3) Inefficiency is...

...who carried companies through peak growth. The latter group focused on growth through drilling and **production** , and when that process no longer produced profits, boards of directors sought people who could...

...to the downstream sectors. Feedstock source will not become an issue until there is a **shortage** . * Exploration, not **production** : **Risk** avoidance and cost-cutting had another effect. Oil companies attacked their most vulnerable cost area...

...It also consumed so much of a dwindling technology budget, little was left for the **production** system and **component** research. Suppliers and engineering firms have been forced to carry that burden, with limited success...

...the development spending in future years. * Development technology needed: With the low investment in offshore **production** system technology in the past two years, operators have reached a crisis point. Conventional steel...

...Smaller companies, without the financial resources, will focus on downstream profitability to survive. A ready **supply** of crude and increasing ties between OPEC and developed countries are providing some assurance of...

3/3,K/19 (Item 11 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

02830835 SUPPLIER NUMBER: 04512128 (USE FORMAT 7 OR 9 FOR FULL TEXT)
California looking to methanol as a motor fuel alternative. (column)
Locke, Robert
Oil Daily, p8(1)
June 20, 1986
DOCUMENT TYPE: column ISSN: 0030-1434 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT
WORD COUNT: 963 LINE COUNT: 00076

... fuel.
Produced from natural gas today -- and with proven technology from America's ample coal **supply** when gas gets expensive -- the high-octane, clean-burning liquid fuel is roughly cost-competitive...

...plants could be put at the site of remote gas supplies and sized to fit **production** .
Its supporters describe methanol as very nearly the best thing since sliced bread.
Largely because of lower prices, "the **demand** for oil in California's transportation sector has increased about 8 percent in just the...
...recommends laboratory and field research.
"The goal of replacing petroleum or at least hedging the **risk** (of sudden **shortage**) has become less a public issue these days," observed Sacramento energy policy consultant John White...

...engines and cut nitrogen oxides dramatically. In cars, it could reduce ozone formation, a primary **component** of smog. Californians give a lot of thought to such things.
White consults with Celanese...

3/3,K/20 (Item 1 from file: 9)
DIALOG(R)File 9:Business & Industry(R)

01446851 Supplier Number: 24119074 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Clouds put damper on growth forecast
(Robust IC sales, rising 10-17% above 1997 levels, will contribute to continuation next year of US economic expansion)
Electronic Engineering Times, p 1+
December 22, 1997
DOCUMENT TYPE: Journal ISSN: 0192-1541 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1646

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...of interest rates, the appreciating U.S. dollar, the assertions of an information-technology labor **shortage** and the **risk** of inflation further cloud analysts' and economists' forecasts.

Businesses that derive a large portion of...

...to inflation late next year.
A more immediate concern, according to some economists, is weak **demand** for U.S. exports.

Lower U.S. exports

Economist John Huizinga, a professor at the...

...third quarter, U.S. real net exports fell 21.6 percent.

Nonetheless, Huizinga believes domestic **demand** will be sufficient to

expand the U.S. economy by 2.5 percent in 1998--provided the United States has the productive capacity to meet the **demand** for goods and services.

Labor shortages could threaten that productivity. The domestic unemployment rate stood...

...on Korean capital investments "could actually help the semiconductor industry" by closing the gap between **supply** and **demand** .

But Thomas Kurlak, chip-industry analyst for Merrill Lynch, believes the industry is grinding toward...
...up by as much as 10 percent in North America.

Equipment for 300-mm-wafer **produ**ction on pilot lines will be among the stronger sellers, according to Dornseif. But the equipment...

...forecasts 15 percent to 20 percent unit growth through the year 2000, owing to declining **component** costs, expanding corporate and consumer **demand** , and growth in international markets. But the firm expects the United States and Europe, not...
?

01407575 00058562

Simulation of woodyard inventory variations using a stochastic model

LeBel, Luc; Carruth, J Steven

Forest Products Journal v47n3 PP: 52-57 Mar 1997 ISSN: 0015-7473
JRNL CODE: FPJ
DOC TYPE: Journal article LANGUAGE: English LENGTH: 6 Pages
SPECIAL FEATURE: Charts Graphs Equations References
WORD COUNT: 3779

DESCRIPTORS: Stochastic models; Forest products industry; Studies; Supply chains; Monte Carlo simulation; Operations research; Inventory control; Probability
CLASSIFICATION CODES: 8630 (CN=Lumber & wood products industries); 2600 (CN=Management science/Operations research); 9130 (CN=Experimental/Theoretical); 5330 (CN=Inventory management)

ABSTRACT: A probabilistic spreadsheet model was written to stimulate the variability present in procuring wood fiber for a papermill. The utility of this type of model is demonstrated, and how data that are readily available to most procurement departments can be used to provide information for optimizing logging capacity utilization and wood inventory is illustrated. Harvesting and hauling are treated as a two-stage pace line, with each stage subject to operation-dependent failures. Historical data on operation failure (largely weather induced) were used to develop probability functions applied to model logging contractors' output rates. Trial runs for a theoretical mill and wood supply system indicated that placing a buffer of 2 days of production between harvesting and trucking operations significantly reduced the number of the days the papermill would experience low inventories. It was therefore possible to decrease the risk of wood shortage at the papermill without having to increase the number of suppliers. Benefits and limitations of the approach are discussed.

TEXT: Headnote:

ABSTRACT

Headnote:

Evaluating the relative costs of logging capacity and inventory is largely an analysis of risk under which the production and capacity utilization of loggers, mill demands, inventory levels, production of by-product, and weather impacts are all important. A probabilistic spreadsheet model was written to simulate the variability present in procuring wood fiber for a papermill. This paper demonstrates the utility of this type of model, and illustrates how data that are readily available to most procurement departments can be used to provide information for optimizing logging capacity utilization and wood inventory. The model treats harvesting and hauling as a two-stage pace line, with each stage subject to operation-dependent failures. Historical data on operation failure (largely weather induced) were used to develop probability functions applied to model logging contractors' output rates. Trial runs for a theoretical mill and wood supply system indicated that placing a buffer of 2 days of production between harvesting and trucking operations significantly reduced

the number of days the papermill would experience low inventories. It was therefore possible to decrease the risk of wood shortage at the papermill without having to increase the number of suppliers. Benefits and limitations of the approach are discussed.

Pulp and paper industries depend on a reliable wood fiber supply to maintain operations. Running out of wood at most papermills is an expensive and generally unacceptable scenario. While the specific situations between mills vary, all mills have to deal with the relationship between wood consumption, wood production, and wood inventory in order to have fiber when they want it.
Despite major technological improvements during the last two decades, forest harvesting operations are still significantly impacted by wet weather. In the southern United States, it is not unusual for logging contractors to lose 10 to 20 percent of their production capacity to adverse weather conditions (7). Wet weather may force a logger to stop inwoods operations because of excessive rutting caused during harvesting or due to access roads that are too muddy and soft to use for hauling. Facing such variability on the supply side, companies often choose to contract their logging operations to a large number of producers. During prolonged periods of favorable dry weather, inventories may grow too large. Quotas must then be imposed to reduce the supplier's flow. Low inventories are sometimes achieved through high idle capacity in harvesting operations. Low-capacity utilization can adversely affect the costs of logging operations (8-10).

Paper companies are interested in reducing the idle capacity of their logging force while maintaining small inventories in the woodyard. This paper documents how a spreadsheet can be used to simulate alternative wood supply scenarios and evaluate the risks and benefits associated with different levels of inventory and logging capacity. Included is an example of how the spreadsheet was used to evaluate one strategy that maintained inventory levels between a minimum and a maximum level without having to resort to imposing production quotas on a large group of suppliers.

OBJECTIVES

1. Develop a model that simulates a papermill wood procurement system's variable environment and generates data for risk and benefit analysis of alternative logging and inventory strategies.

2. Evaluate the feasibility of allowing inventories (buffers) between the harvesting phase and the hauling phase of a logging operation, which could contribute to a more stable wood flow from the forest to the mill, and consequently, more stable wood fiber inventories at the mill.

3. Evaluate the impact of customizing the logging force to help the mill maintain stable woodyard inventories while minimizing the need for production quotas.

MODEL DEVELOPMENT

The model was developed on Quattro Pro Windows version 5.0. A spreadsheet approach was chosen because it is widely used in the forest industry. Spreadsheets have become quite sophisticated in terms of their capabilities and yet do not require advanced knowledge in computer programming. The concept and workings of the spreadsheet can be easily understood and

customized by individuals to reflect their local situations. The model has no commercial pretension. Rather, it should be perceived as a tool to better understand the variability and complexity of southern wood procurement.

The user interfaces with the first layer of the spreadsheet to enter the system's characteristics. The type of data required should be commonly understood by and available to most wood procurement managers. For example, the number of suppliers and their production capability, inventory targets at the mill, and the buffer size allowed between the harvesting and trucking operations must be provided. The model also uses variables for weekly consumption at the mill and weather impact. These items may be customized by the user to suit specific applications. Computations are performed on the second layer. The third layer includes a macro command that will allow the user to perform repetitions of the analysis. Data for analyzing the risk associated with different input combinations are generated by the model through repeated runs.

MILL-BASED MODEL PARAMETERS

The demands of the mill are represented by a series of weekly roundwood or chip orders. For a specific mill, a user would customize this variable field. In our example, weekly wood orders that might be typical of a southeastern U.S. papermill were generated based on historical data from industry sources. The time horizon of 52 consecutive weeks was used. The average weekly order in this example was 24,691 tons per week, with a standard deviation of 4,916. Wood orders to individual vendors (logging contractors) are placed on a weekly basis, and reflect both the current demand from the mill and the actual quantity of wood in storage in the mill woodyard.

A starting inventory is set at the beginning of the 52-week period. In the example, it was set at 75,000 tons. Each week the suppliers' deliveries are added to the inventory while the mill order is subtracted from it. When the deliveries exceed the consumption, the surplus is carried to the next period and inventories increase; when consumption exceeds deliveries, inventories decrease.

Two inventory limits are specified by the user. The first is an upper limit (arbitrarily set at 100,000 tons in our example). When this maximum inventory is reached, loggers must be restricted from delivering wood, and quotas are then imposed. Once the lower limit on inventory size is reached (50,000 tons in our example), extra deliveries are purchased from loggers who may increase their output level (surge).

It is typical for logging contractors to send part of their production to other markets. The user is therefore allowed to divert part of the supplier's production to an alternate market (market siphon). In the present case, 25 percent of the loggers' production does not reach the papermill. Our model does not treat the siphon as a value that changes from week to week. To measure the impact of this variable, subsequent runs with a different value must be made. Users who want to randomize this input to reflect weekly changes could do so but would have to develop their own equations and rationale.

THE LOGGING CONTRACTORS

Up to three types of loggers can be defined in the model (Table 1). This

gives the user the ability to customize a desired logging force. In response to the increasingly popular view that dedicated suppliers benefit the company (4,6), the model allows the user to select a number of "preferred loggers."

For our example, Types I and II are "preferred" contractors and will not be placed on quotas even if inventories reach the upper limit. More specifically, Type I loggers are those that have invested heavily in high-production equipment. Their daily production capacity is 375 tons (approx. 15 loads). Their ability to increase production (surge) when needed is set to be equivalent to 1 extra day (375 tons) per week. Type II loggers are those who have elected to invest in high-flotation equipment such as widetired skidders and tracked felling machines to "waterproof" their operation. In the example presented, their daily capacity is 200 tons, and their surge is set at 200 tons per week. Finally, Type III loggers are the company "fire squad;" when needed, these loggers can significantly increase production by using older, paid-off equipment. Goldratt and Cox (5) would consider them as bottleneck relievers. In the present version of the stochastic model, Type III loggers are the only loggers placed on quotas when inventory levels reach the upper limit. Logic that would allow other logger types to be put on quotas would be easy to build into customized versions.

WEATHER DOWNTIMES AND SYSTEM EFFICIENCY

The impact of weather is the most unpredictable variable facing the supply side of wood procurement in the South. Any model that attempts to evaluate wood supply risk must incorporate a method for simulating the largely unpredictable nature of bad weather, both its timing and its duration. There are a number of ways that the randomness of bad weather incidents can be simulated and their impact calculated in a spreadsheet. Our model works in the following manner.

For each logger type and for each season (winter and summer), an Efficiency Ratio was computed. The Efficiency Ratio (E) is the probability that wood can be delivered to the woodyard on any given day. To compute Ez we used the following formula developed by Buzacott (3):

The key components to compute Ez are failure rate, recovery time, and buffer size. In the present context, failure rates strictly reflect the frequency with which production is lost due to adverse weather. Recovery time is the expression of the time in days elapsed before operations can resume. In a logging environment, repair time can be defined to represent the time necessary for the roads or the harvesting site to dry. Historical data obtained by Loving (8) and LeBel (7) for a group of loggers working in southern conditions were used to support our estimates. Failure rate and repair time were estimated on a seasonal basis to follow weather patterns. It was decided that the winter logging season should cover weeks 1 through 12, and 44 through 52. The summer failure rates and repair time apply to weeks 13 to 43.
(Table Omitted)

Captioned as: TABLE 1.

All logging operations consist of two main activities: harvesting and trucking. In various places around the world, these activities are separated. Technically, such an operation can be treated as a two-stage

paced line (2). The Virginia Tech data (1) show that hauling operations fail at a higher frequency than harvesting operations. However, a longer period of time is usually necessary for the forest soil to dry and allow harvesting conditions to be favorable again. For these reasons, we decided to build a model with the flexibility to enter failure rates and recovery times separately for the woods and hauling operations and define some inventory buffer between the two. The third component of E , buffer size, is the inventory amount, measured in days worth of production, which is allowed to accumulate at the deck or roadside between the harvesting and hauling phases. Using buffers to model the interaction between groups of machines parallels the approach used by Stuart (12) in the HAT computer simulation system.

Table 2 shows the assumed failure rates and recovery times for each logger type and season by harvesting phase. Efficiency ratios shown in Table 2 were computed assuming a buffer size of 2 (2 days of inventory at the loader). When no buffer is allowed, the efficiency values for winter and summer are lower: 77 and 85 percent for Type I, 83 and 89 percent for Type II, and 74 and 83 percent for Type III loggers. The higher efficiency ratios for the buffered scenario reflect the fact that even when trucking is at a halt, harvesting operations can be maintained until the buffer is full. In the same way, as long as the buffer is not empty, hauling is feasible even though harvesting is idled.

Once E subz is computed, a Stochastic Simulation is used to mimic the random impact of adverse weather. E subz is the probability that a logging system will work on any given day. Since wood orders, production, and inventory are adjusted on a weekly basis, a cumulative probability function must be defined to estimate the expected number of days worked per week. For any given day, the probability of working is equal to E subz , and the probability of not working is 1-E subz Depending on the number of days lost, 0, 5, or 10 permutations have to be accounted. Therefore, on a weekly basis, the probability of a logger working 0, 1, 2, 3, 4, and 5 days is: The cumulative probability function is computed for each logger type on a seasonal basis (Table 3). A random number generator then selects a value between 0 and 1 for each week of the planning horizon. This value is compared with the associated probability to obtain the number of days worked during the week. For example, if the random number generated for week 45 (winter) is 0.35, Type I and Type II loggers will work 4 days, and Type III will only work 3 days.

(Table Omitted)

Captioned as: TABLE 2.

INVENTORY FLUCTUATIONS

With each run of the model, inventory levels are generated for a time horizon of 52 weeks. Tables 4 and 5 summarize how weekly production and consumption are computed. The first column shows the weekly wood order from the mill. In the present model, these values are fixed and will not change between simulation runs. The next column displays values between 0 and I randomly generated by the spreadsheet. For each run, new random values are generated following a uniform distribution. This is an important component of the model since the success of a Monte Carlo simulation is largely dependent on how well the random numbers used in the computation simulate the random variables in the model (11). For each week and for each of the

three logger types, the random value is reported to the cumulative probability function of the number of days worked (Table 3). The number of days worked times the number of loggers in the category times the daily production capacity gives the total production. For example, in week 4, Type I loggers: 375 tons/day x 3 days x 11 loggers = 12,375 tons. The summation of the weekly production for each three types gives the total volume of roundwood produced.

Part of the roundwood produced by loggers may not reach the papermill. More lucrative markets such as sawmills and plywood mills often purchase a share of the loggers' production. Accordingly, in the column called "Market Siphon" in Table 5, the loggers' total production is reduced by 25 percent. The roundwood must then be debarked and processed into chips. A volume reduction of 11 percent (industry source) is assumed during this operation due to bark and other losses. The potential weekly chip contribution from our logging force without using surge capacity is thus shown under the column called "Chip Production."

The change in inventory level is obtained by subtracting the mill's weekly consumption from the volume of chips produced. However, the three columns titled "Normal Inventory," "Inventory (+ surge)," and "Inventories (- quotas)" calculate inventory under three different scenarios.

Showing these calculations has the benefit of demonstrating how the following interact: inventory targets, the use of logging surge capacity, and the random pattern of weather. "Normal Inventory" assumes that no action is taken when inventories are below the specified minimum level or when inventories go above the maximum level. This column shows what happens when weather drives everything.

The "Inventory (+ surge)" column reflects the impact of utilizing the available surge capacity of key loggers. When inventories drop below the minimum or "trigger" level, special wood orders are placed, and loggers are asked to increase their production output. Loggers would be asked to produce at surge level until the inventory is back above the minimum level. The user must specify the surge capacity of each logger type. This surge value is the expression, in tons per week, of the logger's capacity to increase output. The random number generated for the week influences the loggers' surge capacity: Type I loggers need a minimum of three workable days during the week to deliver any surge production, Type II loggers need 4 days, and Type III loggers only need 2 days. These constraints simulate the situation where the weather pattern makes it impossible for loggers to produce extra volume even though the mill may need it.

(Table Omitted)
Captioned as: TABLE 3.

(Table Omitted)

Captioned as: TABLE 4.

(Table Omitted)

Captioned as: TABLE 5.

The "Inventory (- quotas)" column invokes control at the maximum inventory limit set by the user. Balancing the risk of no inventory against the cost

of an inventory that is unacceptably high requires some use of quotas. Repeated runs of the model demonstrate that unless a mill's logging capacity is set dangerously low, extended periods of favorable weather will cause inventories to go above the maximum targeted level. When this occurs, our model restricts purchases from Type III loggers until inventories are back to the desired level. The last column in Table 5 presents the inventory levels that are used in the analysis. The weekly variations in inventories for one simulation run are graphically represented in Figure 1. For the first 6 months, inventories were regularly below the minimum targeted level. Surge capacity was purchased whenever loggers could provide it. Better conditions during the second half permitted inventories to grow larger, up to a point when quotas had to be imposed (week 45).

RESULTS

In this type of analysis, it is recommended that as many runs as possible be performed (each time with renewed sampling) to increase the reliability of the results from a statistical point of view. Accordingly, a macro command was written to perform 100 simulation runs for each combination of alternatives the user may wish to select. Information to be used in cost and benefit analysis can be output to separate data sets. Such information might include:

(Graph Omitted)

Captioned as: Figure 1.

(Table Omitted)

Captioned as: TABLE 6.

the number of weeks above and below inventory targets;
occurrence of inventory below zero;

average annual inventory level;

capacity utilization by logger type.

Our simulation was performed once with a buffer size of 0, and once with a buffer size of 2. For this analysis, the supplying group was composed of 11 Type I loggers, 10 Type II loggers, and 8 Type III loggers. This mix of loggers was chosen because it yields capacity utilization values between 85 and 90 percent for Type I and II loggers, and between 80 and 90 percent for Type III loggers. The simulation results are shown in Table 6.

In this case example, allowing loggers to maintain a 2-day buffer between their harvesting and hauling operations significantly reduced the number of weeks for which inventories were under target from 16 to 12. The number of weeks above target, which also represents the number of weeks for which quotas were imposed on Type III loggers, slightly increased when a buffer was allowed. On the average, quotas were needed to reduce inventories at the mill 1.9 weeks per year when a buffer was allowed, and 0.6 week when operating without a buffer.

CONCLUSIONS

Spreadsheet-based stochastic models are useful in assisting procurement organizations to develop the proper balance between logging capacity and

inventory levels. Procurement processes deal with a lot of variability and under- or overestimating its compounding effect on wood flow can lead to very expensive conclusions. As more restrictions are placed on loggers to minimize site impacts, it will become increasingly important for them to be as technically efficient as possible. Thoughtful inventory management can be used as a tool to help loggers get the most out of their production capacity. A simple stochastic model such as the one presented may go a long way in helping procurement foresters and district managers in their strategic planning sessions.

In the presented case study, the number of days for which the millyard receives wood was increased by placing a 2-day inventory between harvesting and trucking. The increase in efficiency yielded a more reliable supply of wood fiber to the papermill. It was observed that woodyard inventories were less likely to be below target when logging contractors increased their buffer from 0 to 2 days. Loggers also benefited from the buffer through higher operations efficiency, as measured in productive work days. This should not be interpreted to mean that larger in-wood inventories are the optimum solution to inventory management. Deck size, wood freshness, pile rotation, and available equipment, are but a few factors that must be considered in a global inventory procedure.

Reference:

LITERATURE CITED

Reference:

1. Anonymous. 1994. Research Update. No. 2 (94). Industrial Forestry Operation Research Cooperative of Virginia Tech, Blacksburg, Va.

Reference:

2. Askin, R.G. and C.R. Standbridge. 1993. Modeling and Analysis of Manufacturing

Reference:

Systems. John Wiley and Sons, Inc. New York
Reference:

3. Buzacott, J. 1971. Methods of reliability analysis of production systems subject to breakdowns. In: Operations Research and Reliability. Daniel Grouko, ed. Gordon and Breach Science Publishers, New York.

4. Deming, W.E. 1986. Out of the crisis. Massachusetts Inst. of Technology, Cambridge, Mass.

Reference:

5. Goldratt, E.M. and J. Cox. 1992. The Goal: A Process of Ongoing Improvement. North River Press, Inc., Great Barrington, Mass.

6. Juran, J.M. and F.M. Gryna. 1993. Quality Planning and Analysis. 3rd ed. McGraw-Hill Inc. New York.

7. LeBel, L.G. 1993. Production capacity utilization in the southern

logging industry. M.S. thesis. Virginia Polytechnic Inst. and State Univ., Blacksburg, Va.

8. Loving, E.R. 1991. Components of logging costs. M.S. thesis. Virginia Polytechnic Inst. and State Univ., Blacksburg, Va.

9. Makinen, P. 1992. Puutavaran

Reference:

kuljetusyritysten Menestymisen Strategiat [Strategies used by timber truck transport companies to ensure business success]. Rept. 238. Acta Forestalia Fennica. The Soc. of Forestry in Finland/The Finnish Forest Res.Inst., Helsinki, Finland. In Finnish, English summary.

10. . 1993. Metsakoneyrittimsen Menestysyekijat [Success factors for forest machine contractors]. Folia Forestalia. Rept. 818. The Finnish Forest Res. Inst., Helsinki, Finland. In Finnish, English summary.

11. Niederreiter, H. 1992. Random number generation and quasi-Monte Carlo methods. Regional conference series in applied mathematics. Published by Soc. for Industrial and Applied Mathematics (SIAM), Philadelphia, Pa. 241 pp.

12. Stuart, W.B. 1981. Harvesting analysis technique: A computer simulation system for timber harvesting. Forest Prod. J. 31 (11):4553.
Author Affiliation:

The authors are, respectively, Associate Professor, Faculty of Forestry, Univ. Laval, Quebec, Canada G1V 7P4; and Harvesting Project Leader, Westvaco Forest Res., P.O. Box 1950, Summerville, SC 29484. This paper was received for publication in February 1996. Reprint No. 8486.

Forest Prod. J. 47(3):52-57.

?